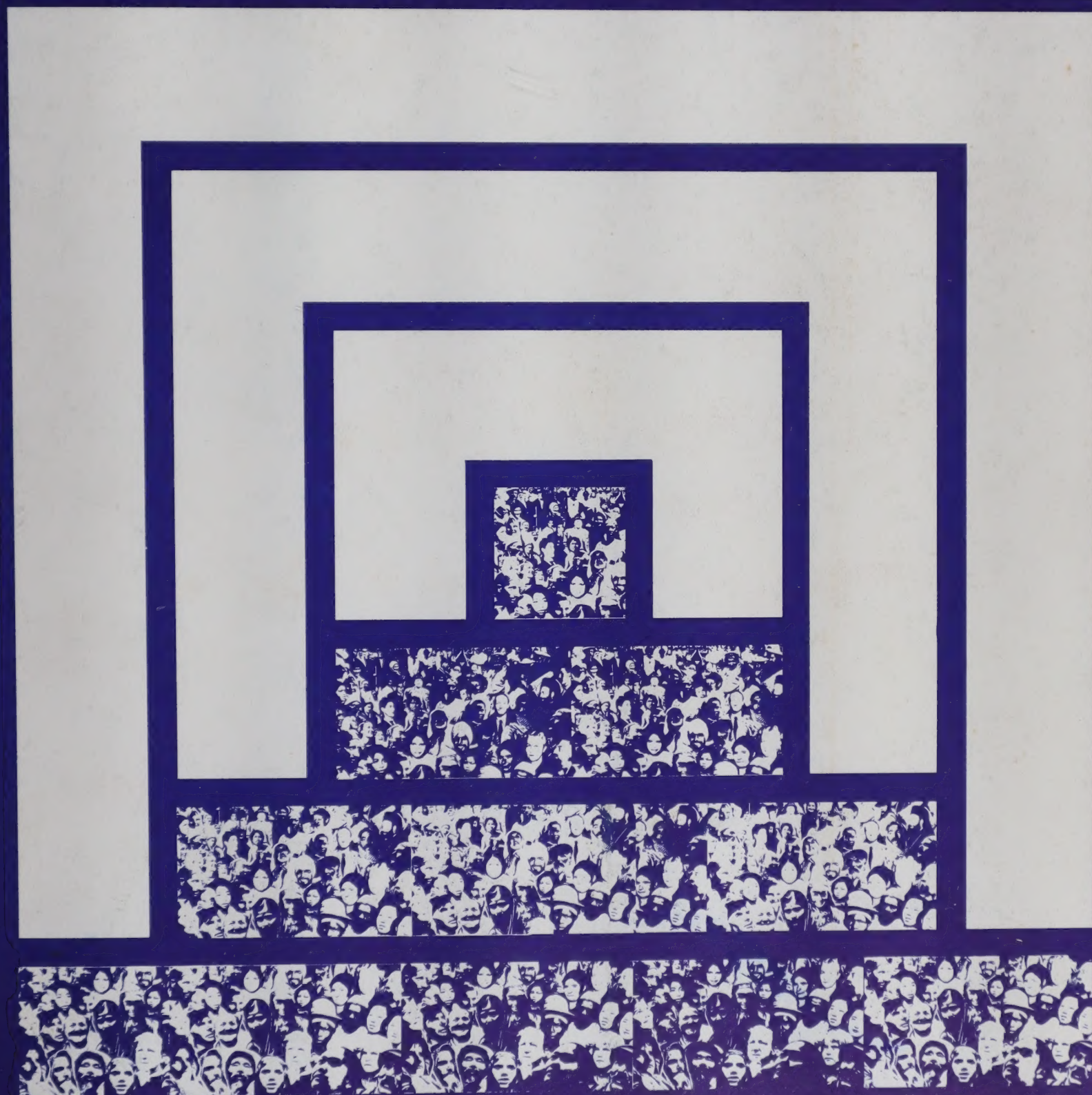


International Conference on Population, 1984

Fertility and Family

Proceedings of the Expert Group on Fertility and Family
New Delhi, 5-11 January 1983



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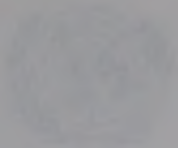
Department of International Economic and Social Affairs

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EXPLANATORY NOTE

The following abbreviations have been used in this document:

ECA	Economic Commission for Africa
ECE	Economic Commission for Europe
ECLA	Economic Commission for Latin America
ECWA	Economic Commission for Western Asia
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organization
ILO	International Labour Organisation
IPPF	International Planned Parenthood Federation
IUSSP	International Union for the Scientific Study of Population
OECD	Organisation for Economic Co-operation and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Fund for Population Activities
WFS	World Fertility Survey
WPPA	World Population Plan of Action

The designations employed and the presentation of material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Where the designation "country" or "area" is used in the text, it covers, as appropriate, territories, cities or areas.

The designations "developed" and "developing" economies are intended for statistical convenience and do not, necessarily, express a judgement about the stage reached by a particular country or area in the development process.

The views expressed in signed papers are those of the individual authors and do not necessarily reflect the views of the United Nations Secretariat.

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

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PREFACE

The Economic and Social Council, in its resolution 1981/87 of 25 November 1981, decided to convene an international conference on population in 1984 under the auspices of the United Nations, to be devoted to the discussion of selected issues of the highest priority, giving full recognition to the relationships between population and social and economic development with the aim of contributing to the process of review and appraisal of the World Population Plan of Action. At the request of the Council, the Secretary-General appointed the Executive Director of the United Nations Fund for Population Activities to serve as Secretary-General of the Conference and the Director of the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat as Deputy Secretary-General.

In the same resolution, the Council authorized the Secretary-General to convene, in preparation for the Conference, four expert groups which would be interdisciplinary and concerned with the interrelationships between economic, social and political factors in population and development with a problem-solving orientation. The expert groups were, therefore, organized by the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat, each of which had the central task of examining critical, high-priority population issues and, on that basis, making recommendations for action that would enhance the effectiveness of and compliance with the World Population Plan of Action. The four expert groups were: the Expert Group on Fertility and Family (New Delhi, 5-11 January 1983); the Expert Group on Population Distribution, Migration and Development (Hammamet, Tunisia, 21-25 March 1983); the Expert Group on Population, Resources, Environment and Development (Geneva, 25-29 April 1983); and the Expert Group on Mortality and Health Policy (Rome, 30 May-3 June 1983).

Contained in this volume are the report and selected papers of the Expert Group on Fertility and Family, which will not only make a valuable contribution to the International Conference on Population itself but will serve as useful tools for future research on fertility and family in the 1980s as well as contribute to the work of the United Nations in that area.

Acknowledgements are due to the consultants, various United Nations organizations and intergovernmental and non-governmental organizations which participated in the meeting and helped in preparing the documents.

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INTRODUCTION

Pursuant to Economic and Social Council resolution 1981/87 of 25 November 1981, the Secretary-General of the United Nations, at the invitation of the Government of India, convened the Expert Group on Fertility and Family in New Delhi from 5 to 11 January 1983. It was the first of four expert group meetings scheduled in preparation for the International Conference on Population, 1984.

Facilities for the Meeting were provided by the Government of India at Parliament House Annexe. The participants included the following experts, invited by the Secretary-General in their individual capacity, representing a broad range of scientific disciplines and geographical regions:

Rodolfo A. Bulatao, East-West Population Institute, Honolulu

C. Chandrasekaran, Bangalore, India

Andras Klinger, Hungarian Central Statistical Office, Budapest

W. Parker Mauldin, Rockefeller Foundation, New York, New York
United States of America

Moni Nag, The Population Council, New York, New York, United States
of America

I. O. Orubuloye, Nigerian Institute of Social and Economic Research,
Ibadan, Nigeria

Hilary Page, Inter-University Programme in Demography, Brussels

Norman B. Ryder, Office of Population Research, Princeton University,
Princeton, New Jersey, United States of America

Fred Sai, Accra, Ghana

Wu Cang-Ping, Institute of Population Research, The People's University
of China, Beijing, China

Nadia H. Youssef, International Center for Research on Women,
Washington, D.C.

The participants also included representatives of the Population Division of the Department of International Economic and Social Affairs and a representative of the Department of Technical Co-operation for Development of the United Nations Secretariat; representatives of the following regional commissions of the United Nations: the Economic Commission for Europe, the

Economic and Social Commission for Asia and the Pacific, the Economic Commission for Latin America, and the Economic Commission for Western Asia; a representative of the following United Nations body: the United Nations Fund for Population Activities; representatives of the following specialized agencies: the International Labour Organisation, the Food and Agriculture Organization of the United Nations, the United Nations Educational, Scientific and Cultural Organization, and the World Health Organization; a representative of the following intergovernmental organization: the Organisation for Economic Co-operation and Development; representatives of the following non-governmental organizations: the International Committee on Management of Population Programmes, the International Planned Parenthood Federation, the International Statistical Institute/World Fertility Survey, The Population Council, Inc., and the Population Institute; and observers for three national bodies: the Institute of Economic Growth, New Delhi, the Ministry of Health and Family Welfare, New Delhi and the International Institute for Population Studies, Bombay, India.

As bases for discussion, five consultants were commissioned to prepare papers corresponding to the substantive items of the agenda as follows:

- (a) Fertility response to modernization;
- (b) Family structure and fertility;
- (c) Choice with respect to childbearing;
- (d) Reproductive and economic activity of women;
- (e) Demographic goals and policies.

The Department of International Economic and Social Affairs prepared, in addition to other background papers, the background document for the Meeting, "Fertility and family: highlights of the issues in the context of the World Population Plan of Action", which was intended to provide an overview of the topics of the Meeting. Other background papers were provided by the Department of Technical Co-operation for Development, the regional commissions, the United Nations Fund for Population Activities, several specialized agencies, the International Planned Parenthood Federation, the International Statistical Institute, and the Population Council. (See annex I, "Agenda", and annex II, "List of Documents".)

Rafael Salas, Secretary-General of the International Conference on Population, 1984, opened the Meeting on behalf of the Secretary-General of the United Nations and invited S. S. Sidhu, Secretary, Ministry of Health and Family Welfare, Government of India, to speak on behalf of the host Government.

Mr. Sidhu welcomed the participants on behalf of the Government of India. He observed that it was highly appropriate that the programme for the 1984 Conference should begin in India which, more than 30 years ago, was the first nation in the world to articulate a policy of fertility regulation and to devise as one of the policy instruments the first national family planning programme. He noted that, in the succeeding years, changes relevant to fertility had accelerated in India and that similar social changes were obviously occurring in other countries. Both fertility and the family had

wide relevance for individual and collective well-being and were thus deserving of in-depth study and analysis. While noting that family planning programmes could have very positive results, Mr. Sidhu exhorted the Expert Group to identify other factors that had a direct or indirect depressing effect upon fertility and to suggest policies relevant to them that were likely to have early success as part of a multi-faceted drive to reduce fertility.

The Secretary-General of the Conference thanked Mr. Sidhu for his warm welcome and for the generosity of the Government of India in hosting the Expert Group Meeting. He noted with appreciation the leadership of India in the formulation and implementation of policies relative to fertility and in the incorporation of these policies into its national development plan. Mr. Salas drew attention to the fact that the questions before the Expert Group represented issues highlighted in the World Population Plan of Action, a document designed to expand the capacity of countries to deal effectively with their population problems. He emphasized that both the principles and the objectives of the Plan of Action remained valid but that, after nearly a decade of population research, policy-making and programming, it was necessary to adapt its provisions in the light of experience since Bucharest. Mr. Salas further emphasized that in spite of the remarkable success of many countries in reducing fertility, others had experienced little, if any, success. What was needed to enhance the scientific bases for planning and policy making was a better understanding of how fertility change came about and how the process could be accelerated; what choices were open to couples and individuals on the one hand and to Governments on the other, bearing in mind the principle of human rights. He expressed confidence that the conclusions and recommendations of the Expert Group would be a valuable contribution to the International Conference on Population.

The Deputy Secretary-General of the Conference, Léon Tabah, informed the participants of the organization of the Conference, noting its continuity with actions of the 1974 World Population Conference, in Bucharest, which had adopted the World Population Plan of Action. He stated that, in accordance with the principles and objectives of the Plan of Action, deliberations of the Expert Group should not be geared to purely demographic and scientific exploration but should relate demographic to economic, social and cultural conditions with a view to facilitating enlightened as well as comprehensive planning in the areas of human reproduction and to providing a background against which elements of the Plan of Action, specifically fertility and family, could be reviewed. Much had transpired since 1974, and a general assessment was in order; results of the Expert Group Meeting would provide an invaluable basis for the assessment.

Noting that the Meeting was concerned not only with questions of fertility and family planning but also with the family - the context within which reproduction and its regulation ordinarily take place - Mr. Tabah reminded participants that, although a variety of movements world-wide were altering the nature and function of the family, it remained the fundamental

biological unit in all societies. He emphasized that participants should give particular attention to the conditions of women and their role in family and society.

The Expert Group elected Nadia Youssef (Egypt) as Chairman and Andras Klinger (Hungary), Vice-Chairman. Moni Nag (India) was designated General Rapporteur. Rafael Salas represented the Secretary-General of the United Nations and Gwendolyn Johnson Acsádi, Population Division, was the Technical Secretary. The following participants acted as discussion leaders: Geoffrey McNicholl, W. Parker Mauldin, Moni Nag, Norman B. Ryder and Nadia H. Youssef. Halvor Gille summarized the policy implications of the substance of the Expert Group Meeting, and Hilary Page presented an overview of the Meeting. Participants serving as Rapporteurs for individual sessions were: C. Chandrasekaran, Andras Klinger, I. O. Orubuloye, Fred Sai and Wu Cang-Ping.

The central task of the Expert Group Meeting was to examine critical, high-priority issues relevant to fertility and family and, on that basis, to make recommendations for action by Governments and international and non-governmental agencies that would enhance the effectiveness of and compliance with the World Population Plan of Action.

The first item of the agenda dealt with ways in which modernization elements in the socio-cultural and economic patterns and institutions of societies alter reproduction. It was observed that fertility was determined by, among other things, the physiological capacity to reproduce, individual preferences, the cost of fertility regulation, marriage laws and customs and social controls. In the discussions, the Expert Group stressed that modernization, or the movements towards higher levels of development, could influence fertility through changes in: (a) the labour value of children; (b) children's value as old-age support and risk insurance; (c) the economic costs of children; (d) infant and child mortality; (e) age at marriage and proportion never married; (f) infecundity due to breast-feeding, malnutrition and disease; (g) post-partum sexual abstinence; (h) widowhood; (i) the physical, psychic and monetary costs of fertility regulation; (j) familial relationships and (k) conditions of women. It was recognized, however, that the full nature of the relationship with modernization for some of these variables was less completely understood than others. A principal issue of the discussions was whether Governments, through policy intervention, could alter norms about family relationships in the absence of changes in the underlying economic and social structure.

The second topic of discussion was the relationship between family structure and fertility. It was held that family structure could be influenced by a variety of factors that would have implications for fertility. Among these factors, the following were susceptible to policy intervention: (a) improvement in education; (b) delayed age at marriage; (c) delayed entry into parenthood; (d) reduction of mortality; (e) elimination of social insecurity; and (f) community involvement. At the centre of the discussions were several questions including what elements of these phenomena influenced family and fertility, what measures could be taken to bring about

the desired changes in them and, indeed, whether Governments were even able to exert any appreciable influence upon the course of social change.

The deliberations on factors influencing choice with respect to childbearing focused upon the complexity of decision-making in matters of reproduction. It was noted that there were differences among cultures and family types in the identity of the decision-maker(s) with respect to fertility. Enhancement of the status of women was seen as a means of ensuring their greater voice in matters relating to childbearing. The Expert Group also expressed concern that there was frequently an absence of conscious choice for many individuals and couples, particularly those residing outside of metropolitan areas of developing countries. In question, too, was a possible conflict between the acknowledged rights to freedom of choice in respect to childbearing and to the rights and goals of society. The acceptability of incentives and disincentives as measures introduced by Governments to achieve social goals was also questioned.

Although the fourth agenda item, reproductive and economic activity of women, was concerned specifically with the condition of women, there were references to this topic throughout the Meeting. The topic was discussed from several perspectives: the amount of reproductive lifetime available to women for productive pursuits other than childbearing; changes in the proportion of this time devoted to childbearing; the introduction of social support programmes, income-generating opportunities and other measures to increase women's opportunities apart from the reproductive role; and the domestic duties and responsibilities of men.

In the discussions of demographic goals and policy alternatives, the fifth item on the agenda, the policy options considered were family planning programmes, incentives and disincentives, social and economic development, and marriage and divorce laws. Elements that characterized effective family planning programmes were discussed. Particular attention was given to the importance of local institutional settings for the achievement of government policy goals. With respect to policy measures other than family planning programmes, their potential benefits, given certain conditions of development, were discussed, as was the efficacy of such measures and the need for empirical research to determine their effects.

There was agreement about the desirability that every Government should articulate a population policy in the light of national circumstances and goals and that Governments had an obligation to take both short- and long-term measures to alleviate the interrelated problems of population growth and structure on the one hand, and conditions of development, on the other. It was the Expert Group's consensus that even adoption of a policy of non-intervention should be a conscious decision. The Expert Group agreed that countries implementing family planning programmes should establish quantitative programmatic targets at the operational level. The establishment of such programmatic targets at the regional and/or global levels was also considered.

Participants took note with appreciation of the technical co-operation activities in support of developing countries carried on by member organizations of the United Nations system. While recognizing that national Governments carry the major responsibility for action in the area of population policy, the need for continuing support, through both bilateral and multilateral, public and private institutions, was underscored by the Expert Group. It was also noted that technical co-operation among developing countries could make a significant contribution. Among the means noted whereby Governments might realize greater benefit from technical co-operation were better co-ordination of assistance from all sources and improvements in the institutional structure of developing countries for receiving assistance.

I. FERTILITY RESPONSE TO MODERNIZATION

Central to the theory of transition from high to low fertility is the role played by modernizing elements in the society. Whether defined as an alteration of the structural institutions of society, pervasive technological innovation, advancement of socio-economic systems and institutions to higher levels of development or in some other way, the process of modernization was taken to resemble the changes experienced by the more advanced countries in their movement from agricultural to industrial economies, from highly rural to highly urbanized nations and from family-oriented to highly individualized societies.

The Expert Group noted that modernization in the less developed countries would be different from that in the more developed countries because the latter were in the vanguard and, consequently, constituted an environment for the former, producing forced adaptation. While it had long been recognized that fertility tended to decline in response to the modernizing influences of society, the failure of most researchers to examine the channels or variables that changed with modernization and through which the latter affected fertility had resulted in comparatively less focus being placed upon tendencies for fertility to rise during early stages of modernization and upon the changes within society that were responsible. With the identification of variables associated with fertility decline as well as of those thought to be responsible for its temporary increase, an empirical basis existed for the formulation of measures to support higher or lower fertility.

The Expert Group felt that no one index, such as per capita gross national product (GNP), educational enrolment, average educational attainment or the urban percentage of the population, could, in itself, serve adequately as a measure of modernization. Furthermore, identification of modernization should involve the qualitative as well as the purely quantitative changes. Unfortunately, the institutional dimensions of modernization were not well defined or susceptible to simple measurement.

It was observed that fertility was determined by, among other things, the physiological capacity to reproduce, individual preferences, the cost of fertility regulation, marriage laws and customs and social controls.

Utilizing the Easterlin framework - distinguishing the supply and demand for children and the costs of fertility regulation as the categories of fertility determinants - nine variables or sets of variables were identified as being among those through which processes of modernization could affect fertility: (a) the labour value of children; (b) children's value as old-age support and risk insurance; (c) the economic costs of children; (d) infant and child mortality; (e) age at marriage and proportion never married; (f) infecundity due to breast-feeding, malnutrition, and disease; (g) post-partum sexual abstinence; (h) widowhood; and (i) the physical, psychic and monetary cost of fertility regulation. In addition to the variables identified in the Easterlin model, the Expert Group added two additional contextual variables: the condition of women and familial relationships. It was recognized, however, that the full nature of the relationship with modernization for some of these variables was less completely understood than others.

Within the framework of the 11 sets of variables mentioned above, it was seen that the first four influenced the demand for children and that, in the course of modernization, changes in these variables exerted a negative impact upon fertility. Evidence was cited of the positive correlation between measures of children's work activity and birth rates; the labour value of children was known to decline with modernization. While the direct and indirect costs of children increased, their value as old-age support and risk insurance was seen to decline in the process of modernization. The introduction of alternative social support systems and the opening to women of educational and extra-familial job opportunities could accelerate this process. However, child labour laws and compulsory education were viewed as unlikely to reduce the labour value of children unless other conditions were favourable. A lowering of infant and child mortality as a consequence of modernization could also contribute to the process of fertility decline.

Among the factors affecting the supply of children (age at marriage and proportions never married; infecundity due to breast-feeding, malnutrition and disease; post-partum sexual abstinence and widowhood), the response of some to modernization was seen to have the potential of producing an increase in fertility, at least in the short run. An increase in the age at first marriage would theoretically shorten the period of exposure to childbearing and thus negatively influence fertility. Improvements in nutrition were also known to have a positive, although slight, effect upon fecundity. The role of disease in augmenting infecundity was not well studied but it was recognized that it could be potentially significant particularly in some tropical African countries.

Post-partum abstinence, where it prevailed as a custom, was a powerful determinant of completed family size and a highly effective birth-spacing mechanism. Though practiced by nearly all women for a short time, the custom was adhered to over lengthy periods by women in some developing countries, particularly those in tropical Africa. In these societies, abstinence normally endured for the duration of breast-feeding and often longer, two or three years. The practice was breaking down with urbanization and the weakening of traditional mores, creating the potential for fertility

increase. Higher fertility in the short run could also be expected as sexually transmitted and other diseases declined, thanks to advances in medical technology, and as improvements were realized in the amount and quality of food intake. Declines in the incidence of widowhood and increases in the remarriage of widows were also likely to occur as the society underwent modernization. All of these changes favoured an increase in natural fertility and, unless measures were implemented successfully to counteract their effects, a rise would occur, at least temporarily.

Of these factors, the Expert Group concentrated the most attention on breast-feeding. The negative relationship between natural fertility and the incidence and duration of breast-feeding was well-established in the literature. The practice of breast-feeding postponed the resumption of ovulation and, therefore, lengthened the interval between births in the absence of contraceptive use. Various aspects of the modernization process had been linked with a decline in the duration of breast-feeding, including urbanization, the education of women and their employment in economic activities outside the home environment. However, in a comparative context, the countries that were viewed as more developed and that had the lowest fertility were also those with a lower incidence and average duration of breast-feeding.

The Expert Group viewed declining breast-feeding trends in many developing countries with concern primarily because, if the trends should continue in the absence of improved sanitation and education, infant mortality would be likely to rise. Concern was also expressed that the resulting increase in natural fertility would require increased family planning activities just to maintain the actual level of fertility. None the less, even if current levels of breast-feeding were sustained, the recommended earlier adoption of supplementary feeding would quicken the resumption of ovulation and thus increase natural fertility. There was a question as to the extent to which current trends in breast-feeding patterns were reversible, but despite a lack of evidence on this point, it was generally agreed that it was important to encourage breast-feeding in the first few months. It was the consensus of the Meeting that family planning programmes should encourage contraceptive use among nursing mothers, once supplementary feeding had been introduced, and should provide them with suitable methods.

In addition to the demand and supply factors influencing fertility, the cost of fertility regulation was seen to have physical and psychic as well as monetary dimensions. Advanced contraceptive technology and, of late, the introduction of organized national family planning programmes and simplified sterilization procedures, had contributed towards a reduction in the costs of fertility regulation. The existence of actual and perceived side effects of presently available modern contraceptive techniques was viewed as an important obstacle to their use, particularly in developing countries. None the less, it was concluded that, even with available contraceptive technology, there was scope in almost all contexts for increasing the efficacy of family planning programmes.

The effect of the final two factors on fertility - familial relationships and the condition of women - are discussed below in sections II and IV, respectively.

In the view of the Expert Group, fertility decline had not always awaited the achievement of critical thresholds in all the aspects of the complex process of modernization. Furthermore, the introduction of family planning programmes in certain contexts could, in the opinion of some, be viewed as an aspect of the modernization process. The Expert Group discussed the extent to which modernization could be induced or altered through policy implementation. In this connection, divergent views were voiced about the efficacy of Government exhortation of small family norms as a means of transforming traditional values in the absence of underlying economic and social development. It was generally agreed, however, that well-executed information, education and communication programmes could accelerate, if not serve as a catalyst for, this transformation of values and the adoption of the small family norm. Information, education and communication programmes might also be utilized in lowering the non-monetary costs of fertility regulation.

The Expert Group also recognized that, from a comparative perspective, it was appropriate to focus international attention on the long-term societal implications of low fertility in terms of changes in the age distribution of the population and the burden of old-age support, as currently experienced by many developed countries.

II. FAMILY STRUCTURE AND FERTILITY

The second topic of discussion was the relationship between family structure and fertility. The reproductive behaviour of individuals and couples was seen to be conditioned, as were other facets of life, by the institutions that made up the individuals' socio-cultural frame of reference. As societies became increasingly modern, institutions emerged or were strengthened, becoming competitive with the kinship system (mainly the family) for control over or influence upon individual behaviour. As other institutions gained in influence, the family might also undergo certain change, relinquishing some of its roles and altering its functions, if not its structure; and the roles of family members were also modified.

There were differences of opinion in the Expert Group about whether a change in family structure necessarily accompanied or preceded a decline in fertility. A prominent view was that along with the radical structural transformation of society that was represented as modernization, there occurred an alteration of family structure, occasioned by, among other things, an alteration of the intergenerational contract - a change in the relationship between father and son. This took place along with or following specialization in many spheres and the emergence of other aspects of economic development. Then, fertility declined. Another view held that this was not universal; in some Asian countries, lower fertility had not been accompanied or preceded by a change in family type and structure.

The importance of the debate lay not only in the theoretical relevance of the question, but in the need to determine the elements that influenced change in the interrelationships between family structure and fertility and that were amenable to policy. The topic of relevance, then, was how social change transforms the family, given that fertility decline was a part of that transformation. As already enumerated in the introduction to this report, the following factors were viewed as being susceptible to policy intervention: (a) improvement in education; (b) delayed age at marriage; (c) delayed entry into parenthood; (d) reduction of mortality; (e) elimination of social insecurity; and (f) community involvement.

Many developing countries were experiencing changes in family structure that were related to fertility and evidently also to modifications in the condition of women. Results of some studies provided evidence of an association between these phenomena and an advancement in women's education. In this connection, it was important to identify what elements of education might be responsible for its influence upon fertility. Acquisition of a modest amount of education often meant a delay in age at marriage and, where it resulted in functional literacy, afforded the woman some independence and the ability to acquire knowledge on her own. Education provided a different source of norms for the individual and promoted a career apart from the family.

The Expert Group noted that a change in age-at-marriage patterns might be effected more readily if reasons for early age at marriage were ascertained and, to the extent possible, policies implemented to eliminate them. After all, age at marriage was determined by cultural norms, beliefs and religious prescriptions. Thus change would require intensive Government effort in the areas of information, communication and community education. It was reported that delayed marriage had made an important contribution to the decline of fertility in China, and that where education had been successfully promoted, marriage was automatically delayed. In rural areas where the level of education was lower, laws to delay marriage were more necessary.

Delay of entry into parenthood was posed as a policy option because, in many societies, marriage did not signal the beginning of sexual relations. Pregnancy and childbearing in early adolescence, whether within or outside marital unions, was viewed as creating significant health problems for both mothers and their children and as impairing the right of young people, particularly women, to have access to education and employment opportunities. Further, premarital pregnancies could have social consequences and could occasion early marriage; such pregnancies frequently consigned a woman to less than desirable circumstances for the remainder of her life.

The Expert Group felt that it was important to ensure that contraceptives for adolescents should be selected carefully, taking into account the differences among them in regard to age, parity, marital status, number of current partners and family residence, among other things. Adolescent pregnancy was a widespread problem with important policy implications. There was consensus that young people should be informed of its hazardous effects,

and that support should be provided to those unmarried youth who resisted peer pressure to engage in sex. Community involvement should be encouraged to modify the institutions that fostered adolescent pregnancy.

There was general agreement that the elevation of women's status would have consequences for the family as an institution. In many developed countries, particularly among those in Northern and Western Europe, Northern America and Oceania, marriage and childbearing were being called into question. There had been a movement from a family-oriented to a more individualized society as increasing numbers of couples were foregoing childbearing. Indeed, there was some question whether it was possible to achieve a highly desirable goal, such as low fertility, without losing some of society's traditional values. Some participants emphasized that the achievement of lower fertility was likely to carry certain non-monetary costs to society, costs that might include irreversible changes in culture and valued social institutions. However, in support of a divergent view, the example was given of Taiwan, Province of China, which had experienced a rapid fall in fertility without the abandonment of traditional family type and structure, although alterations of family function had been observed.

The Expert Group considered that community involvement to minimize the unfavourable consequences of change while enhancing fertility decline was an option that was insufficiently employed. Indeed, community involvement could have an invaluable impact as, for example, in broadening the scope of social security for all members of the society as changes in the family occurred and, at the same time, in reshaping the norms regarding family-size values and customs.

The Expert Group discussed the extent to which Governments were able to influence social change. One opinion was that social change, particularly as regards the family and family relationships, was a by-product of modernization and did not ordinarily occur in its absence. However, the case was made that this was too extreme a view; different kinds of Government settings could have a critical effect upon the structure of the family. The social control of marriage age and of household formation had played an important role in restraining fertility historically in the now developed countries, and Governments of developing countries could affect these variables. Further, the more successful family planning programmes were those in which the national Government had played a strong role. Policies designed to influence demographic and social change were, in any case, being made, frequently in the absence of reliable information as to their probable impact.

The view was that, in the formulation and implementation of policies in the areas of fertility and family, Governments invariably confronted the issue of whether priority should be given to the wishes of the individual, the family or society. The question was considered pertinent in view of the increasing tendency in some countries to exert pressure upon couples and individuals to practice family planning. Such pressure took the form, inter alia, of incentives, disincentives and target setting. The Expert Group concluded that policy could not be implemented in isolation from the social

setting. Consequently, it was difficult to generalize as to what policies might be applied in various conditions of social change. A guiding principle of the discussion was that human rights should be preserved.

III. CHOICE WITH RESPECT TO CHILDBEARING

The context in which reproductive behaviour takes place may be one in which individuals and couples make a conscious choice, rational from their perspective, as to whether and /or when to have a child, or it may be one in which they lack either the wisdom, motive or both to regulate fertility and, thus, make no conscious choice as to the number or spacing of births, allowing them to occur at a natural pace. Where individuals and couples were able to make a choice and did so, as was increasingly the case with the modernization of developing countries, they tended to weigh preferences for number and timing of children against other values, including economic ones. These considerations included, inter alia, some notions about fecundity; sex preferences for children; perceived child mortality risks; perceptions about the value of children and their costs and the costs of regulating fertility. While family-size desires tended to be based upon parents' perceptions of the values and cost of children, the scope for decision-making was circumscribed by social institutions and cultural norms instead of individual level behaviour.

In the view of the Expert Group, couples in some societies, particularly rural inhabitants of developing countries, did not make fertility decisions for themselves, because the cultural norms provided that parents, in-laws or even the community might impose fertility levels. Furthermore, the Expert Group also recognized that in poor rural communities, women themselves often favoured large families. Thus, there were likely to be cross-cultural differences in the impact of women's own preferences upon fertility. An understanding of how and in what phases of the life cycle fertility decisions were made was seen to be an important ingredient in the design of successful family planning programmes both with respect to their education and information components and in terms of community participation and the demographic characteristics of the target groups.

The Expert Group devoted much attention to the efficacy and the ethics of incentives and disincentives, in view of their possible infringement upon the right of individuals and couples freely and responsibly to choose the number and spacing of their children. Incentives had been adopted as policy in a number of countries with a view to inducing acceptance of family planning. This practice had the potential for abuse of human rights, especially of the poor, when financial rewards were given to the service provider and/or the family planning acceptor. For the latter, the remuneration was often the sole consideration for adopting a contraceptive, though it might in no way have been commensurate in value with what the acceptor was required to relinquish. The provision of free contraceptives, information and supplies, which

represents a form of incentive, was not viewed as problematic. However, disincentives were seen to be abusive if they adversely affected the innocent child as well as the parents and if they penalized the poor more than the rich.

The Expert Group agreed that, while it was in the nature of Government activity to design incentives that would influence individuals to behave in a manner supportive of social goals, such measures should not further differentiate social classes nor infringe upon individual rights. If Governments attempted to alter individual preferences through the use of coercive measures, the individual right to choose with respect to childbearing, as articulated in the World Population Plan of Action, would be undermined. The Expert Group noted that some countries had implemented incentive and disincentive programmes at the community level. Whether these types of measures were ethically more acceptable than individual incentives and disincentives was debated.

Many of the developed countries that had desired higher levels of national fertility had given parents substantial cash allowances according to their family size as a means of encouraging large families. However, the effect upon fertility was not clear: the timing of births appeared to have been modified, but it was unclear that family size had been affected. There was consensus that the scientific community should give high priority to further research on the effects of incentive and disincentive schemes both with respect to human rights and with respect to their influence on fertility and contraceptive acceptance.

The Expert Group took into account that the World Population Plan of Action recognized the basic human right of individuals and couples to decide freely and responsibly the number and spacing of their children and recommended that all countries should respect and ensure this right, regardless of their demographic goals. The Expert Group noted, however, that the sum of individual choices might not automatically or inevitably coincide with official policy goals. Where Governments considered that action to influence fertility was called for, the role of the Government was to make every effort to inform the population of its national goals and priorities as well as of their rationale. Such actions might include family planning programmes, measures concerning social and economic development, incentives and disincentives and laws concerning family formation and reproduction; such measures should conform to internationally recognized human rights and the prevailing cultural values of the society.

The Expert Group noted that, since the 1974 World Population Conference, there had been some evidence that, in certain settings, community level efforts to influence fertility had produced desirable results. Such efforts had proved to be useful in parts of Indonesia. The broadened social support for low fertility through the organization of rural people at the local level was one of the possible means by which developing countries might realize their fertility targets, since in the year 2000, an estimated 56 per cent of the population of these regions would still be rural, compared with 69 per cent in 1980.^{1/}

The Expert Group recognized that there was a need to begin to consider the social, cultural and ethical aspects of the implications of new developments in medical sciences, genetics and the sex determination of children. There were a number of countries in which children of a given sex were preferred, an attitude that influenced the number of children born to a couple. With progress in medical science and early determination of the sex of a foetus, there could be a growing tendency to express sex preference by early terminations of pregnancy, especially in countries where medical termination of pregnancy was allowed.

IV. REPRODUCTIVE AND ECONOMIC ACTIVITY OF WOMEN

The condition of women is inextricably interrelated with the social and economic milieu and the demographic setting in which they live. These conditions are nowhere more evident than in the family life cycle and patterns of childbearing. They are both a cause and a consequence of women's levels of education, their opportunities for gainful employment outside the home, conditions of mortality at all ages and among both sexes, age at marriage, access to and information about fertility regulation methods and other related factors.

The conditions of women in developing and developed countries arose in the discussions of each substantive topic of the agenda. In this connection, the Expert Group recommended that Governments should take all action necessary to prevent the practice of female circumcision or any similar ritual practice detrimental to the health and well-being of young women. Banishment of such practices would obviously have an effect upon intra-familial relationships and possibly also upon fertility.

But, in the present context, the subject was viewed principally from the perspective of the ways in which the length of the childbearing period bore upon the range of options available to women during their productive years. The childbearing interval consisted roughly of the period from first marriage to the birth of the last child. The Expert Group agreed that work experience before marriage was an important factor influencing age at marriage (as well as the likelihood that a woman would work after marriage). Studies had shown that women's work rates increased with the advances in the age of the youngest child. Where people tended to desire many children or where fertility regulation was not widespread, childbearing consumed by far the major portion of women's productive years, and they had few options as to other pursuits.

The consensus was that Governments should encourage realistic options for women at potential turning points in their life cycle and educate women to realize that as mothers they would continue to have options. In the areas of education and training, alternative policies outside the formal educational structure might be directed towards adult women not reached by the formal system, imparting practical marketable skills tailored to the needs of the local economy. In the employment and income-generating areas, new options

should be developed that did not rely entirely on the formal sector of the economy where job openings were limited. In addition, some were of the opinion that the current emphasis upon breast-feeding was excessive and might erode women's choices.

There was some question as to the empirical evidence with respect to the relationship between women's work and fertility or between women's status, familial roles and fertility. In certain contexts, social support systems could permit a woman to achieve high fertility without impeding her economic activity. In addition, a long childbearing interval did not necessarily imply a large family in cultures with long periods of post-partum abstinence. It was not well known empirically how work in agriculture influenced fertility: differential fertility within agricultural populations had been inadequately explored. Emerging evidence from research of the Food and Agriculture Organization (FAO) showed important differentials by land distribution patterns. On the other hand, research undertaken at the Economic Commission for Europe (ECE) found fertility differentials by women's work to be the most significant of all fertility differentials in the data from the World Fertility Surveys for developed countries.

Family planning programmes in many developing countries offered women the technology to limit the portion of their lives that was devoted to childbearing but, even when they could take advantage of the programmes, there were few alternatives for them that would encourage cessation of childbearing. However, it was observed that family planning programmes themselves could and did play a role in providing options for women through improvements in their health and the spacing of their births and through information and education about the benefits of smaller families and reduced time devoted to childbearing.

In the view of the Expert Group, access to personal improvement and development-oriented projects, particularly educational and employment programmes, should be accorded to all groups of women; in particular, the programmes should include all young women, regardless of marital status. Work opportunities for women that involved cash remuneration should be encouraged wherever possible because of the importance of women's control over money in increasing their decision-making role within the family. The Expert Group noted that it was not sufficient to enact legislation supporting women's employment and in particular employment of mothers, and strong action was required to implement income-generating programmes at the local and community levels. Community participation could be an important option for women in addition to their economic and maternal roles.

The effect of women's education upon fertility was seen to vary among countries. In those at the low end of the development spectrum, an increase in education might lead to a rise in fertility, at least in the short run, because of its positive effect on natural fertility. On the other hand, among developing countries with higher mean levels of educational attainment, illiterate women had extremely high fertility. They represented an obvious target group for Governments seeking to reduce fertility levels. It was,

therefore, important to develop strategies to communicate with the men and women who could not be reached through formal education programmes of illiteracy eradication and who, by the end of the twentieth century, would number approximately one billion. There was also a need to intensify research into factors which, along with education, could influence fertility decline, inasmuch as education per se could not affect fertility, at most being a factor in the shaping of fertility norms.

There was some concern that the encouragement of women's economic roles was problematic in societies that currently suffered from high rates of male unemployment. However, the policies that were being recommended by the Expert Group focused on the development of income-generating projects rather than on the competition for traditional jobs. It was emphasized that, in the competition for scarce jobs, many women had financial responsibility for the support of their families and were, therefore, no less deserving than male bread-winners.

The view was widely shared that any new recommendations dealing with the condition of women should not focus exclusively on women's roles but should broaden concern to the sexual division of labour with accompanying recommendations regarding men's domestic duties and responsibilities. The Expert Group felt that more attention should be given to the importance of the sexual division of labour in family structure and to fertility decision-making.

V. GOALS, POLICIES AND TECHNICAL CO-OPERATION

Since the 1974 World Population Conference, there have been major changes in the course of fertility in many developing countries and improvements in the knowledge of fertility levels and trends. A decade ago, there was much controversy about both the levels and trends of fertility in developing countries. Now, despite the fact that the basis for assessing fertility conditions - population censuses and vital statistics registration - remain inadequate, the levels and trends are known, at least approximately, for nearly all countries. The problems remain of what influences the levels, how trends should be interpreted, and what measures may be taken to alter them when it is deemed desirable to do so. Population policies may be designed and implemented to achieve pronatalist or antinatalist goals and, with respect to fertility, policies include all measures taken by Governments specifically for such purposes.

The Expert Group noted that a problem to do with policy implementation was that many developing countries that viewed their birth rates as too high did not have demographic goals. For example, 81 of the 126 developing countries had official family planning programmes, but only 58 of those were designed expressly to achieve lower fertility. Of these, 23 countries (representing 72 per cent of the population living in the developing world) had set quantitative population targets either in the form of overall growth

rates or fertility rates.^{2/} Moreover, many countries had declared support for family planning, but had taken no action in that regard and many of those that were pursuing their goals had not achieved them.

The manner in which family planning goals were expressed was of enormous importance for, as the Deputy Secretary-General of the Conference stated, the World Population Plan of Action, in paragraph 37, had rejected any recommendations for specific demographic goals for the reduction of fertility. However, he saw no way of foretelling the outcome of a similar discussion at the International Conference on Population, 1984.

The Expert Group was in accord that, since Governments did and should set goals and even intermediate targets, they should be given guidance on the kind of goals that were meaningful and practical, given their demographic, social and economic circumstances. Many Governments had established a goal defined as a desired aggregate level of fertility. There were other goals that could also be adopted, such as the proportion of unmet needs to be met for family planning. As one important goal, it was suggested that Governments could set a target date for achieving the recommendation of the Plan of Action "to respect and ensure, regardless of their overall demographic goals, the right of persons to determine, in a free, informed and responsible manner, the number and spacing of their children".

In the opinion of the Expert Group, a need existed for a systematic analysis of the demographic goals of each country, exploring whether and how these goals had changed in response to improved knowledge of demographic and social conditions and to the changes occurring in the society. It was important to know whether population policies were focused upon certain population groups or whether their provisions applied equally to all. There were, for example, many countries with taxation policies to benefit the poor, to support large families, to encourage small ones and so on. Policies might support the aged, adolescents, married couples or other groups; they might also be discriminatory at the expense of unmarried persons or others.

It was acknowledged that population policies had generally been articulated within the context of development planning and policy-making. Family planning programmes, for instance, were usually seen as aids to social and economic development; and in this respect their formulation could be seen as an integral part of the process of development planning.

The Expert Group reviewed demographic goals and policies relating to fertility and family from the perspective of the policy options open to planners and policy-makers. The options considered were family planning programmes, along with social and economic development, incentives and disincentives, and laws concerning family formation and reproduction as mentioned above. It noted that while the national family planning programme had emerged as the principal policy instrument that Governments applied to attain lower fertility, the programmes differed widely in quality, coverage, administration and logistics. The following elements were considered to characterize the more effective ones: a good delivery system; a wide variety

of methods; high quality service; reasonable anonymity for clients where necessary; accessible service and low-cost service and supplies; information about the advantages and disadvantages of methods; the availability of a medical referral system; and a re-supply system. These, plus the extent of Government commitment and support, the effectiveness of information, education and communication (IEC) strategies and the degree of community involvement were among the characteristics that determined the success of the programmes.

It was clear, therefore, that family planning programme administrators required many kinds of data (including baseline data for monitoring) as well as analytical studies for programmatic purposes. Researchers should be more sensitive to the needs for such information, particularly in evaluating the impact of the programme on fertility. The Expert Group noted in this respect that much progress had been made in evaluation research, notably in the work of the Population Division of the United Nations, often in collaboration with the International Union for the Scientific Study of Population.

The Expert Group took the position that, although family planning programmes had served as policy instruments for over three decades, there remained many unresolved problems and issues. Programmes did not make the best use of existing methods, nor did they enable a choice among all acceptable methods of family planning, including natural methods such as rhythm and abstinence. Further, progress had been too slow in the development of newer and safer methods. The international community should mount a concerted effort to accelerate the pace of improvement in contraceptive technology. There was consensus that it was incumbent upon the international community to address the ethical, social and legal implications of new contraceptive technologies.

Another issue related to appropriate administrative settings for family planning programmes. It was affirmed that family planning programmes had often been integrated with broader health-care activities, but some recent experiences had shown that they could also be integrated with a variety of other development activities, such as rural development schemes, women's co-operatives, labour unions etc.

In some countries, community participation had greatly aided the effectiveness of family planning programmes. The question arose as to the means by which the desired involvement could be achieved. No single formula for active community participation in family planning programmes was applicable to all countries or communities within a country; and it might be necessary to determine the approach on a country-by-country basis.

The local-level institutional setting was seen to be an extremely important ingredient in determining fertility change and in governing policy effectiveness. Therefore, the Expert Group agreed that Governments, in implementing population policy, should endeavour to mobilize local institutions to achieve policy goals, to the extent this could be done without an adverse impact on human rights.

The Expert Group considered in some depth the issue of how various other social institutions, in addition to the family, impinged upon fertility behaviour. Examples of such institutions included, most notably, the local community, but also others such as mutual assistance societies, labour organizations, men's and women's co-operatives, production groups and other voluntary organizations and primary groups. Both the question of how such institutions influenced the behaviour of individuals, and of how such institutions might be influenced by Government policies were raised. The Expert Group concluded that these institutions could, in appropriate circumstances, make a valuable contribution to the efforts of Governments to meet fertility goals. It was also fully recognized by the Expert Group that the nature of such institutions varied enormously from one country to the next, that no one universal model of how such institutions might most effectively be engaged could be proposed.

In summary, with respect to family planning programmes, incentives and disincentives and socio-economic measures as population policy options, the Expert Group singled out several considerations as noteworthy. First, fertility decline was seen to have occurred more rapidly in countries where goals had been set; thus, in order to accelerate fertility decline, Governments might establish a system to monitor progress towards achieving goals. The Expert Group emphasized strongly that family planning programmes had already made significant contributions to lowering fertility. Further, the Expert Group felt that it was important to emphasize that Governments and political parties should not use family planning programmes to political advantage or manipulate access to services for various ends. The continued importance of the private sector's role in family planning activities was also stressed.

With respect to the question of incentives and disincentives, discussed in greater detail in section III above, there were a wide variety of measures currently in use which differed either because of the nature of the reward, the identity of the recipient or the time frame. Owing to the paucity of knowledge, it was considered essential that there should be more research to assess the impact of these schemes in their various contexts.

With respect to socio-economic measures, there was some discussion of the efficacy of guaranteed employment programmes as a means of reducing the environment of risk which was seen to encourage high fertility. However, more research was considered necessary, in order to increase knowledge of the impact of various forms of social security on risk environments and on fertility behaviour.

With regard to the areas of technical assistance and technical co-operation to developing countries, participants were apprised of the activities of members of the United Nations system. A large share of technical assistance had, of course, been borne bilaterally by Governments and private institutions. There had not been much empirical research to determine problems that arose in the effective utilization by Governments of technical assistance and the implementation of policies and programmes related to

fertility and family. A study carried out by the Organisation for Economic Co-operation and Development (OECD) offered some guidelines for prospective future collaboration between donor agencies and Governments. First, it was necessary to plan more realistic scheduling and use of funds for a given activity over a specified period of time to facilitate programme implementation. Donor agencies should focus more on the operation and the management of the project that they had funded and on aiding Governments to realize their programme goals, rather than upon their internal procedural requirements. More should be done to develop the institutional structure in recipient countries to enable the administration and management of technical assistance resources and to improve the calibre of management personnel. In this connection, technical assistance should be strengthened with the view to enhancing the institutional capacity of recipient Governments.

In the view of the Expert Group, among the major priorities for 1984 was the implementation of the principles and objectives of the World Population Plan of Action. Despite the fact that some Governments had passed legislation and had adopted measures in the population policy sphere, these actions had not always been effectively implemented and much work was needed before such actions could become operational. Governments should enlist strong social support in order to make these actions meaningful.

VI. RECOMMENDATIONS

The Expert Group reiterated the full validity of the principles and objectives of the World Population Plan of Action and, in particular, the principle that "all couples and individuals have the basic right to decide freely and responsibly the number and spacing of their children and to have the information, education and means to do so; the responsibility of couples and individuals in the exercise of this right takes into account the needs of their living and future children, and their responsibilities towards the community".

Following intensive discussions of the state of knowledge about fertility and family, their interrelatedness with the well-being of individuals and of societies, and the changes that had occurred over the past decade, the Expert Group recommended a variety of actions that, in its view, would lead towards the achievement of the objectives specified in the Plan of Action.

The subheadings used in the presentation of the following recommendations is not intended to suggest any order of priority.

POPULATION POLICY

1. All Governments should, on the basis of the fullest possible knowledge about the national demographic situation and its economic and social consequences, establish population policies within the context of their national priorities and goals. Policies of non-intervention should be arrived at as a conscious decision.
2. In particular, all Governments are urged to set their own quantitative targets with respect to fertility levels. The establishment of indicative targets at the regional and global levels may prove useful and should be considered, taking into account that they should not interfere with the sovereignty of the Government.
3. Changes in the level, trends and characteristics of the population should be taken into account in the formulation and implementation not only of population policy but of social and economic development planning as well.
4. The information, education and means necessary for people to exercise freely and responsibly their right to the number and spacing of their children should not be withheld for demographic or other reasons. Government policies designed to influence fertility trends and patterns and the measures to support these policies, including incentives, disincentives and other inducements, should be consistent with the principles of human rights.
5. Governments should clearly specify the political and operational steps to be taken in achieving national policy goals and should inform their inhabitants of these goals and of their responsibilities towards the achievement of these goals.
6. Governments desiring to influence fertility should identify a wide range of factors susceptible to policy intervention that have a direct or indirect effect upon fertility and should formulate policies relevant to these factors that are likely to meet with early success and that use resources wisely.
7. To the extent that the economic contribution of children is viewed as a factor contributing to the maintenance of high fertility in many countries, conditions should be created which allow the implementation of child labour legislation and compulsory schooling laws.
8. There are no populations in which low fertility is combined with sustained high mortality. While reducing mortality is desirable for its own sake, an even greater effort should be made by national Governments and international organizations, particularly in the countries where fertility remains high, to promote a decline of general mortality with special attention to infants and children.

9. Wherever necessary, institutional changes should be initiated which would provide substitutes for children as the principal source of old-age support and risk insurance. To this end, Governments should, inter alia, promote mechanisms for and support structures through which communities can assist in the care, comfort and security of the aged, orphans and other vulnerable groups, where family structure and relationships are not sufficient to provide for these needs.

FAMILY PLANNING

10. Governments should make possible the distribution of all effective, safe and legal methods of family planning for both the limiting and/or spacing of births to ensure that individuals shall have freedom of choice, and to increase the acceptability of such methods, utilizing, where appropriate, private and commercial sources of supply. Among other things, the coverage and quality of family planning programmes should be improved, particularly in rural areas. Appropriate forms of contraception should be provided to women who are breast-feeding.

11. Community participation in programmes with the aim of altering fertility or changing the social, economic and cultural values and institutions that influence it should be fostered. Voluntary organizations and local formal and informal groups should be actively involved in the planning and implementation of family planning and other development programmes. Popular participation should be encouraged and supported.

12. Some family planning programmes have been effective even when not integrated with other development programmes. However, Governments are invited to consider integrating their family planning programmes into development programmes in order to increase their efficiency.

13. Countries implementing family planning programmes should establish programmatic quantitative targets at the operational level.

14. Administrators of family planning programmes should consider integrating local communities in their planning, management, policy-making and implementation. In this integration effort, both women and men should participate fully and as equals.

15. The safety and effectiveness of fertility regulation methods should be continually monitored in order to prevent negative side effects. Measures should be taken to increase the capacity of developing countries to monitor the safety and acceptability of fertility regulation methods in accordance with individual as well as national needs and conditions.

16. In implementing family planning programmes, Governments should assure that appropriate attention shall be given to the protection of the safety of all family planning acceptors including the provision of appropriate follow-up services.

THE CONDITIONS OF WOMEN

17. The complete integration of women and men into the development process by means of equal access to formal and non-formal education and equal opportunity to participate in the social, economic, cultural and political life of the community should be a national goal. Its achievement can influence fertility decline, among other desirable changes.

18. In countries in which women marry at very early ages, it is recommended that (a) Governments should enact social measures which would have the effect of raising the age at first marriage for females by increasing the opportunities for young women to further their education and to obtain subsequent employment and by providing them with access to means of fertility regulation; and that (b) legislation against child marriage should be enforced.

19. Governments should enact policies to give women access to viable employment and income-earning opportunities as a means of strengthening their roles and activities outside the household while, at the same time, improving their standard of living. This might be achieved, for example, by enacting appropriate labour legislation to ensure women's right to work, by offering specialized training in occupational skills that are in demand, by facilitating women's access to credit and by providing support systems to permit both men and women to combine parental roles with economic activities.

20. To strengthen women's roles outside the home, Governments should also implement specific support programmes that would take into account the different needs of women of different marital statuses and at different stages of the life cycle, with due regard for parity and family responsibility. In particular women of low parity and below age 30, regardless of marital status, should be given priority attention. Programmes should encourage young women to delay the start of childbearing, provide mothers with alternatives to continued childbearing and provide widows and divorcees with opportunities for fulfilment in non-familial roles. In situations of high unemployment, special steps should be taken to ensure that the participation of women in the labour force shall not be compromised, since many are heads of families.

21. Governments should remedy the effects of male out-migration upon families left in the sending areas, by providing income-generating opportunities for women.

22. In countries with high fertility, Governments should undertake special activities with the aim of making their populations aware of the high proportion of women's lives that are spent in bearing and rearing children.

ADOLESCENT FERTILITY

23. Over the past decade, adolescents in many countries have become increasingly sexually active. They should, therefore, be given adequate education, including family life and sex education, to enable them to understand fully the consequences to themselves and to any future offspring of their own sexuality and possible premature parenthood. Contraceptive services should be made available to adolescents in conformity with their basic human rights as individuals with due consideration for prevailing cultural values. In selecting contraceptives for adolescents, special attention should be given to the particular needs of different age groups among married and unmarried adolescents.

24. In both developed and developing countries, there should be community programmes in support of education and fertility-regulating services for adolescents. Such efforts should include counselling and encouragement for adolescents who wish to abstain from sex.

INFORMATION, EDUCATION AND COMMUNICATION

25. Information, education and communication (IEC) activities should be undertaken in support of population policy. They should be based upon empirical research, and should reflect conditions in local areas. The collection of baseline data is essential for the monitoring of these activities. To ensure effective IEC programmes, training of IEC personnel in management, evaluation, media techniques, community organization and methods of interpersonal communication should be promoted.

26. Innovative information, education and communication activities and community involvement strategies are needed to reach an increasing proportion of the one billion adult illiterates estimated by the end of the century in developing countries through population programmes.

MANAGEMENT AND TRAINING

27. Governments, international agencies and non-governmental organizations should promote and give financial and other support to the training of demographers and specialists in allied fields to ensure the full utilization of demographic data and studies and their appropriate interpretation for planning and policy-making in matters dealing with fertility and family.

28. The quality of management is considered to be a significant variable in the performance of family planning programmes. Therefore, priority should be given to adequate allocations for management improvement and training in that part of national budgets devoted to population activities. Similarly, support

for management improvement and training should receive priority support from the United Nations, other international agencies and non-governmental organizations.

29. As a national policy, there should be long-term planning and the establishment of realistic priorities in aid of effective community-level participation in the management of family planning programmes.

30. Improvement of the quality of officials charged with policy management should be a national goal. Developing countries should be given multilateral and bilateral assistance for the improvement of the calibre of middle level workers in family planning programmes and in other projects relating to fertility and the family.

INTERNATIONAL CO-OPERATION

31. Developing countries have benefited greatly from the contributions of bilateral and multilateral and public and private organizations to the development of national capabilities for data collection and research, as well as to action programmes in the area of fertility and family planning. Governments should strengthen the collaboration and co-ordination of activities with organizations at all levels in programme implementation and support for population policy initiatives, harmonizing assistance from all sources in order to derive the greatest possible benefits.

32. The donor community jointly with the Governments of developing countries should establish a set of priorities in the light of the principles and objectives of the World Population Plan of Action, taking into account the need for flexibility in relation to varying conditions in the implementation of technical co-operation.

33. Governments should increase their contribution to international population assistance, making long-term commitments.

34. Governments of developing countries should, when necessary and upon request, be given assistance in implementing the World Population Plan of Action in operational terms, with elements of monitoring, evaluation and feedback being built into individual projects.

35. In order to improve the formulation and implementation of population policies, technical co-operation should be provided, among other things, for strengthening institutions with respect to data collection, processing and dissemination, programme evaluation and analysis.

RESEARCH

Demographic data

36. Highest priority should be given to improving the supply and quality of statistics on the size and characteristics of national populations, and on fertility and mortality patterns as obtained in population censuses, household surveys and vital registration systems. The decennial censuses should be followed by post-censal surveys that allow for more intensive interviewing on a broad range of topics.

37. Over the past decade, the World Fertility Survey (WFS) has made an important contribution to the knowledge of reproductive behaviour and fertility regulation. Future work in this area should give more emphasis to developing national capabilities in the field of data collection and survey-taking. In those countries where survey capabilities are already strong, second-round WFS type of surveys should be encouraged to follow up on the valuable investment already made, and means should be sought to support these endeavours.

38. Countries should determine the data to be collected in population censuses and demographic surveys, in the light of their needs for policy formulation and implementation. This should be done prior to the development of questionnaires in order to ensure that the necessary data shall become available.

Determinants of fertility

39. More research on institutional and cultural determinants of fertility should be encouraged because it may offer important opportunities for population policy intervention.

40. Studies should be carried out to determine how and in what phases of the family life cycle fertility decisions are made, whether and how family-size desires change with progression through the life cycle, and whether the identity of the decision-maker may also change with the phase of the life cycle.

41. Although it has received substantial attention over the past decade, research is still required on the mechanisms through which socio-economic factors such as education and income influence fertility behaviour.

42. The tendency of modernization to first elevate and then reduce fertility should be further investigated.

43. The societal implications of long-term low fertility and the consequent aging of the population should be studied and the design of appropriate policies for such situations should be explored.

Operational research

44. Studies should be made of the comparative effectiveness and demographic impact of family planning programmes under alternative organizational structures: programmes that are integrated administratively and operationally with other development sectors versus non-integrated programmes; centralized programmes versus decentralized ones; and public-sector-dominated programmes versus programmes relying on private voluntary organization or commercial distribution.

45. Research should be undertaken to determine how culture impedes or enhances the acceptance of family planning and what measures are likely to lessen any conflict between family planning programme efforts and cultural beliefs and institutions. Further, cross-cultural studies should be made to determine the impact of various kinds of incentives and disincentives on fertility behaviour, as well as to determine the implication of such measures for human rights.

46. Emphasis should be given to the development of improved methodologies for assessing the impact of direct and indirect policy measures on fertility.

Bio-medical research

47. Governments and funding agencies should support existing contraceptive research and encourage the development of new contraceptives, particularly male ones. Analyses should be made of the effects of the different methods on the health of women and men who use them. Appropriate methods should also be developed which would meet the specific needs of adolescents and which could be utilized safely and effectively.

48. Biomedical research in contraceptive technology should be sensitive to the varying acceptability of specific methods in different cultures.

49. Highest priority should be given to scientific studies of fertility and sub-fecundity.

Notes

1/ United Nations, "Estimates and projections of urban, rural and city populations, 1950-2025: the 1980 assessment" (ST/ESA/SER.R/45), pp. 28-29.

2/ World Population Trends and Policies, 1981 Monitoring Report,
Volume II, Population Policies (United Nations publication, Sales No.
E.82.XIII.3).

ANNEXES

Annex I

AGENDA

1. Opening statements
2. Election of officers
3. Adoption of the agenda
4. Fertility response to modernization
5. The relationship of family type, structure and function to fertility levels and change
6. Choice with respect to the bearing of children: assessment of alternative perspectives on decision-making in reproductive behaviour
7. Reproductive and economic activity during the female life cycle
8. Demographic goals and policy alternatives: influence of alternative Government strategies, including family planning, upon fertility
9. Policy implications of the discussions and aspects of technical co-operation for development
10. Overview of the meeting
11. Adoption of the report
12. Closing of the meeting

Annex II

LIST OF DOCUMENTS

<u>Symbol</u>	<u>Title/author</u>
IESA/P/ICP.1984/EG.I/1	Provisional agenda
IESA/P/ICP.1984/EG.I/2	Annotated provisional agenda
IESA/P/ICP.1984/EG.I/3 75	Recent trends and conditions of fertility (Population Division, United Nations Secretariat)
IESA/P/ICP.1984/EG.I/4	Family Planning and fertility (Latin American Demographic Center)
IESA/P/ICP.1984/EG.I/5	Technical co-operation in the field of fertility and the family (Department of Technical Co-operation for Development, United Nations Secretariat)
IESA/P/ICP.1984/EG.I/6	Socio-economic determinants of achieved fertility in some developed countries: a multivariate analysis based on WFS data (Economic Commission for Europe)
IESA/P/ICP.1984/EG.I/7	Marriage and fertility in Africa (Economic Commission for Africa)
IESA/P/ICP.1984/EG.I/8	Some health-related aspects of fertility (World Health Organization)
IESA/P/ICP.1984/EG.I/9	A report on levels and trends of fertility in the ESCAP region: comparative analysis of WFS data (Economic and Social Commission for Asia and the Pacific)
IESA/P/ICP.1984/EG.I/10	Differentials in urban-rural fertility in the countries of the ESCAP region (Economic and Social Commission for Asia and the Pacific)
IESA/P/ICP.1984/EG.I/11	Comparative analysis of fertility levels and trends as assessed from twenty world fertility surveys (Population Division, United Nations Secretariat)
IESA/P/ICP.1984/EG.I/12 125	Fertility response to modernization (Moni Nag)

<u>Symbol</u>	<u>Title/author</u>
IESA/P/ICP.1984/EG.I/13	Sources of variation and change in the share of women's productive lives devoted to child-bearing (Nadia Youssef)
IESA/P/ICP.1984/EG.I/14	Marital status composition and fertility: a methodological approach applicable to a comparative analysis of fertility surveys data (Centro Latinoamericano de Demografia)
IESA/P/ICP.1984/EG.I/15	The World Fertility Survey's contribution to the understanding of fertility levels and trends (World Fertility Survey Secretariat)
IESA/P/ICP.1984/EG.I/16	Familial roles and fertility: some labour policy aspects (International Labour Organisation)
IESA/P/ICP.1984/EG.I/17	Fertility and family planning (International Planned Parenthood Federation)
IESA/P/ICP.1984/EG.I/18	Relationships between fertility and education: a comparative analysis of WFS data for 22 developing countries (Population Division, United Nations Secretariat)
IESA/P/ICP.1984/EG.I/19	Content and process in fertility decisions: a psychosocial perspective (Rodolpho A. Bulatao) 159
IESA/P/ICP.1984/EG.I/20	Women's education and fertility relationships in 14 World Fertility Survey countries (United Nations Educational, Scientific and Cultural Organization)
IESA/P/ICP.1984/EG.I/21	Fertility and family structure (Norman B. Ryder)
IESA/P/ICP.1984/EG.I/22 (see ST/ESA/SER.R/49)	The impact of population structure on crude fertility measures (Population Division, United Nations Secretariat)
IESA/P/ICP.1984/EG.I/23	Marital status composition and fertility: a comparative analysis of WFS data (Economic and Social Commission for Asia and the Pacific)
IESA/P/ICP.1984/EG.I/24	Measuring the impact of population policies and programmes on fertility (W. Parker Mauldin)

<u>Symbol</u>	<u>Title/author</u>
IESA/P/ICP.1984/EG.I/25	Marital status and fertility: summary report of an analysis of WFS data (Population Division, United Nations Secretariat)
IESA/P/ICP.1984/EG.I/26	Fertility, family and health: some current issues (World Health Organization)
IESA/P/ICP.1984/EG.I/27	Some relationships between marital unions and fertility in six countries of the West Indies (Population Division, United Nations Secretariat)
IESA/P/ICP.1984/EG.I/28	Fertility and the family: highlights of the issues in the context of the World Population Plan of Action (Population Division, United Nations Secretariat)
IESA/P/ICP.1984/EG.I/29	Infant and child mortality as a determinant of fertility: the policy implications (World Bank)
IESA/P/ICP.1984/EG.I/30	Operational responses to the World Population Plan of Action in programmes of the United Nations Fund for Population Activities in the areas of fertility, family and family planning (United Nations Fund for Population Activities)
IESA/P/ICP.1984/EG.I/31	Notes on the local context of demographic change (Geoffrey McNicoll)
IESA/P/ICP.1984/EG.I/32	Role of information, education and communication in family planning programmes (United Nations Educational, Scientific and Cultural Organization)
IESA/P/ICP.1984/EG.I/33	Determinants of fertility behaviour: summary of a UNESCO survey and its policy implications (United Nations Educational, Scientific and Cultural Organization)

ANNEX III

OPENING STATEMENTS

A. Statement by the Executive Director, United Nations Fund for Population Activities and Secretary-General of the International Conference on Population, 1984

It is an honour for me to address the Expert Group on Fertility and Family of the International Conference on Population, 1984.

It is most appropriate that we should start in India where the first government population programme of the modern era began over thirty years ago. Through its readiness to deal with problems of population, the Government of India gave a lead to the developing countries in making population a vital sector of development plans, its hosting the first Asia and Pacific Population Conference in 1963 foreshadowed both the involvement of the United Nations in population programmes and the World Population Conference in Bucharest in 1974. All of us owe our hosts the leadership that made possible the present global consensus, and we thank them for their generosity in inviting us to New Delhi to discuss the important questions on fertility and family.

The questions you are about to deliberate on, arise directly from the 1974 World Population Plan of Action. The Plan encouraged Governments to acknowledge the relevance of population to development planning and the usefulness of family planning programmes. It was designed to expand the capacity of countries to deal effectively with their population problems. While we acknowledge that both the principles and the objectives of the Plan remain valid, we should, after nearly a decade of population research, policy-making and programming, be able to adapt its provisions to the changing conditions in and perceptions of the countries.

The first Expert Group will discuss what for many governments is the essential question: the causes and consequences of fertility decline. The development strategies of many countries today include targets for fertility decline and it is a fact that there has been phenomenal success in accelerating fertility decline in several of these. But we are also confronted with some frustrating examples of countries where, in spite of intense effort over a long period, fertility remains high. The questions of how fertility changes come about, and how the process can be accelerated, remains partially unanswered.

In discussing these questions we are all aware that we are not concerned only with bringing about slower rates of growth. While slower population growth has come to be the aim of the Governments of the great majority of the

developing world's people, it will have consequences which will need close attention in the future. What will be the effects of a rapidly aging population, for example, or one in which the extended family network is no longer the mainstay of the social structure, especially in regard to the care of the aged and the infirm?

The World Population Plan of Action sees the family as the cornerstone of society. A better understanding and elaboration of the family as an institution, its dynamics and its relationship to fertility, will be required by the 1984 Conference.

The Plan makes proposals in respect of a variety of demographic, social and economic factors which influence fertility and support family planning as a basic right. It also acknowledges the right and responsibility of Governments to develop and implement population policies in the context of national development goals. The discussions of this Group should make possible a thorough review of progress in these areas since Bucharest.

At this meeting you will be discussing some of the critical issues involved in fertility change. The questions that should continue to concern us all are: under what circumstances will people regulate their fertility? How can the course of fertility change be accelerated? What choices are open to couples and individuals on one hand and to governments on the other, bearing in mind the principles of human rights?

To these questions, experiences of the the United Nations system in the management and execution of population programmes are directly relevant. If your recommendations are to have the needed impact at the Conference, they have to be operationally relevant to what is being experienced by the developing countries.

At the outset, programmes have to be broadly conceived and must relate not only to problems of population growth but also to those of structure, distribution, composition and their implications for development. They must reflect efforts to reduce imbalances between demographic pressures on one hand and development potential on the other. There should be comprehensive assessment of a country's population and development objectives and strategies before projects are initiated and implemented.

Secondly, there must be sensitivity to national conditions and flexibility in programming. It has become clear that programmes of fertility regulation may succeed in the most diverse economic and social circumstances if they are introduced in a manner which is in accordance with prevailing cultural values.

Thirdly, for the effective implementation of programmes, the establishment and strengthening of governmental units solely responsible for population is of vital importance. There should be a co-ordinated central organ overseeing the implementation of population projects and a necessary

complement to these is the involvement of the community in the introduction and management of the programmes, including the utilization of traditional networks.

Lastly, due consideration must be given to factors that may increase the effectiveness and outreach of fertility regulation programmes such as community-based delivery services, greater involvement of women in population programmes, and the exploration of traditional methods and "natural" family planning.

The International Conference on Population will be innovative in length of its documentation. There will be no more than 140 pages of documentation to encompass the issues of fertility and the family, mortality and health policy, migration and urbanization, and resources, environment and development. It is essential that the conclusions and recommendations of this Expert Group which will be one of the sources of the final documentation, be characterized both by clarity and brevity. I am certain that given the calibre of the members of this Expert Group, your contributions will be valuable, exemplary and illuminating.

B. Statement* by the Director of the Population Division,
Department of International Economic and Social Affairs
of the United Nations Secretariat, and Deputy Secretary-
General of the International Conference on Population, 1984

I would like, at the very outset, to join in the words of thanks expressed by Mr. Rafael Salas, Secretary-General of the International Conference on Population. I also wish to express my gratitude and that of my colleagues of the Population Division, to you Dr. Sidhu and, through you, to the Government of India, for having made it possible for us to organise jointly and in so short a time, this meeting; we look forward confidently to obtaining from it a major contribution to the preparation for the Mexico Conference.

Next, if you will agree, I would like to report to you briefly on the plans for the scientific preparations for the Conference. A basic decision taken by the Population Commission of the Economic and Social Council was that the principles and objectives of the World Population Plan of Action, as adopted in Bucharest, remain fully valid and are not subject to change. These principles and objectives have, therefore, served as a framework for all the scientific preparations of this meeting of experts which is one of the first steps in the substantive preparation for the Conference.

*Original in French.

It may be recalled that a central theme of the World Population Plan of Action is that the main cause of population problems is underdevelopment, and that population has no intrinsic significance isolated from its economic and social context. On the other hand, the Plan has also emphasized that demographic variables ought not to be viewed as merely passive agents; they can influence development and can accelerate it.

It follows from these principles that we cannot formulate the issues with which we are concerned in purely demographic terms; the significance of population variables is enhanced to the extent that they are considered together with other social and economic variables. This meeting is important not as a means to discover some narrowly defined demographic truths, but rather to place them in their more complex but realistic economic, social and cultural setting.

It must not be forgotten that the International Conference on Population will not be an assembly of population experts - such as those organized by the International Union for the Scientific Study of Population - but rather a meeting of representatives of Governments. As was the case for the preparations for the Bucharest Conference, the Population Commission has decided that the discussion of representatives of Governments at the Conference can be effective only if it is preceded by careful scientific preparation. It is thus you who have been entrusted with the task of stimulating the policy makers, by setting before them the full range of their options and by helping them assess the consequences of the decisions for which they are responsible. The conclusions reached by the policy-makers will have to be based on the scientific assessments that you present to them.

I need not add that the results of your deliberations should be presented in the least technical terms possible. Our chief goal is to review the Plan of Action so as to adapt it to the demographic changes of the last ten years, to enlarge its scope so as to permit a broader interaction with the other development variables, to take into consideration emerging issues and new perspectives which have appeared in one or another of the numerous conferences or other scientific forums on other related subjects held since Bucharest. We must also further reinforce the Plan's action-oriented components so as to make its implementation more effective in the years to come. Without trying to limit our efforts entirely to purely operational propositions, we should try to work in terms of a set of issues that is as broad and as action-oriented as possible.

It is essential to move forward; to step back is out of the question at a time when the demographic situation as well as social, economic and political conditions are vastly different from those that prevailed in 1974. In our time, the more prosperous fortunes of a few continue to be counterposed to the aggravated misery of the many. The world has undergone greater changes in the course of the last ten years than during the previous decades, and one of the changes which is not among the least important is that a number of Governments have changed their attitude concerning their population problems and are now preparing to take such measures as others have taken or intend to

take. There are many ways to formulate and implement a population policy and the Conference will provide a fresh opportunity to exchange ideas and experiences, and even to organize new forms of co-operation among countries. The industrialised countries themselves, some of which felt very much less touched by population problems at the time of the Bucharest Conference, are now facing new demographic problems, although these are very different from those of the developing countries.

In the tentative agenda of this meeting we have selected a number of items of the Plan of Action which, in our opinion, should be discussed in the course of the next few days. It is up to you to decide, and this goes without saying, if the selection and the degree of attention proposed for each of these items is appropriate.

It is important to emphasize from the outset that this meeting should not concern itself only with fertility and birth control, but also with the family. The Population Commission has taken the position that it is not only fertility that poses a demographic problem. Indeed, what should draw our attention is the couple, the marriage, the roles and statuses of men and women, the relationships between and through the generations, the very conception of the societies of today and tomorrow. The entire system of values of a society and its world view are involved in attitudes towards the formation and the growth of families. It would thus be appropriate to move the discussion beyond family planning alone to a perspective giving to the family the attention it deserves.

I would like to caution, however, that we ought not digress too much on the search for a definition of the family. Of greater importance to us is the issue of the structure of the family, as it is linked to the cultural patterns of society. This may constitute an agenda in itself. If we look beyond the individual as a unit and take into view both the experience of the industrialised countries with low reproductive rates and traditional societies with continuing high fertility levels, we observe that family structures extend over a wide range, from the nuclear parent-child group to the extended family branching laterally and vertically in various directions.

What is particularly striking is that throughout all the process of formulation and reformulation of views on social and political structures, a process which has profoundly modified our conceptions of the social system, the family as a basic concept continues to survive, although undergoing profound changes in form and function. It is quite evident that the tempo and conditions of life, habits and customs (which may have undergone greater changes in the last 20 or 30 years than during the preceding three centuries), the process of industrialization and the continuing flow of immigrants towards densely populated towns have shaken the family as much as any other social institution; at times these forces have shattered it, and everywhere they have transformed the family structure.

The family as a basic institution has survived, be it in the form of the extended family or the nuclear family - a veritable fortress where the individual can find moral as well as material support. It remains a

fundamental biological unit, as in the past; it continues to be the indispensable social group for the socialization of children. Its emotional as well as social functions continue to be important in modern societies as in traditional ones.

This should indicate the emphasis we place on the agenda item concerning effect of modernization on the evolution of the family. We must ask ourselves, on the one hand, whether the family as an institution has the structural flexibility to further sustain the impact of economic and social changes, and on the other, whether it itself may be an instrument of social change. In this respect, my own view is that there is a sort of reciprocal link between the internal structure of the family and the society, such that any change introduced in one brings about a change in the other.

Similarly, as demonstrated in the paper of Norman Ryder there is an interdependence between the patterns of family relationship and the process of moving through the different stages of the demographic cycle.

We are now beginning to observe significant disruptions of family life brought about by the demographic transition. We have seen how a decline in mortality, and especially infant mortality may lead to a decline in fertility which in turn reduces the probabilities of couples having an heir capable of carrying on the family tradition. Such motives are quite natural in traditional societies or amongst some groups where a woman continues to bear children till such time as she has the assurance of being able to rely on the support of at least one son in her old age. We recognize the economic value of children, as is borne out by the papers presented by Moni Nag and Rodolfo Bulatao. We can also see that the longevity of the couple is increasing and the probability of disintegration of the household through death is diminishing. The period during which a woman bears and brings up children is being reduced; the number of years that children live, while their parents are still alive has increased as has the number of overlapping generations.

We should consider not only demographic but also biological factors, such as the interrelationship between infant mortality, breast-feeding and fertility. The World Fertility Survey has provided a rich harvest of data on this issue as well as on many others; it provides information which was not hitherto available and whose value is enhanced by being derived from the experience of many countries. We may use it to analyse attitudes and behavioural patterns in their variety of social contexts, a necessary step since the so-called "personal" variables are not at all the only significant ones. In particular, we must take into account the background of the social and political climate that influences individual variables. Similarly, we should consider the increasing impact of expanding education on the condition of women and children and hence on the economics of the family.

If there was a substantive issue that was not sufficiently dealt with at Bucharest, and which has obvious policy relevance, it is the condition of women. The issue has, however, been the subject of two international

conferences since 1974. It will be discussed here as one of the agenda items. As has been pointed out by Nadia Youssef, on the average some 14 to 18 years elapse between the beginning and end of childbearing in the third world. This is a long period during which women are confined to the household, subjected to male domination and kept away from other activities. This does not, however, prevent them from devoting some two thirds of their time to work. Discussion of the condition of women is of crucial importance for any understanding of fertility trends and their future. We shall devote a whole session to this subject.

Finally, the last agenda item will be the formulation and objectives of policies concerned with fertility and family.

In this context, we must take into consideration the change in the attitudes of people as well as Governments over the course of recent years. The inhibitions attendant on the concept of birth control have slowly died down. The moral, cultural and even political hurdles have given way almost everywhere to the exigencies of reality. That couples should have the right to have as many children as they want by spacing them as best suited to their particular situation seems perfectly logical and even essential for the equilibrium and the health of the entire family.

We should begin by evaluating the effects of family planning programmes on the modifications of fertility. To aid us in this work, we have before us a document prepared by Parker Mauldin. We shall have to examine the extent to which the different sub-groups of population, have access to the necessary services, including family planning; the extent to which these services meet with the particular requirements of the populations for which they are intended; the degree to which development policies have succeeded in indirectly influencing changes in fertility (as is envisaged in paragraph 32 of the Plan of Action); to which villages and communities were supported in the implementation of the programmes; and finally, the extent to which Governments have succeeded in informing, educating and creating an awareness amongst people of the necessity of modifying patterns of traditional behaviour. We shall also have to compare the goals set by Governments with the adequacy of the means they have made available to attain their objectives. You may recall that at Bucharest, Governments rejected the suggestion, especially by Asian delegates, to adopt quantitative targets for fertility. Such quantitative targets are clear and can facilitate the continuous evaluation of the extent to which we have reached our goals. It is entirely possible that our experience with fertility targets will be different in Mexico. We should be ready to respond with appropriate recommendations for goals, if the Governments now take a different position on this issue than they did at Bucharest.

Last but not the least, there is the serious problem of abortion. Bucharest was nearly silent on this issue since it is highly controversial and could well break any consensus. It is quite possible that this issue, which continues to stir consciences, may not permit us to arrive at a consensus even at Mexico. We should follow the dictates of prudence since nearly 150

Governments will be meeting together. At the same time, though, I feel it essential to observe that after several centuries of religious taboo, social veto and silence, an increasing number of jurists, opinion leaders, doctors, and religious figures have begun to reconsider the issue seriously and without arousing adverse responses. Abortion continues to exist despite widespread fear, and women continue to undergo it. It is experienced most harshly by the poorest women. The draft documentation prepared by the Secretariat for the Conference must be objective and must refrain from taking sides. Nevertheless, it cannot totally overlook this issue.

These then will be the subjects of your discussion. I wish you all success and assure you that my colleagues and I will do our best to help you in your deliberations.

Part Two

BACKGROUND PAPERS

I. GENERAL OVERVIEW

A. Fertility and the Family: highlights of the issues in the context of the World Population Plan of Action

United Nations Secretariat*

INTRODUCTION

Certain major themes run through the sections of the 1974 World Population Plan of Action which are devoted to fertility and the family. These general themes remain valid. None the less, a decade of further demographic change as well as a decade of experience with and application of some of the goals and principles of the Plan of Action may lead to a change of emphasis and direction in certain cases. First, the Plan of Action emphasized the important interrelationship between development and fertility and directed attention to certain development policies that were seen to moderate fertility levels. Second, the basic rights of persons to determine the number and spacing of their children in the context of appropriate information and education was strongly asserted. Third, the improvement of the status of women as a development goal was given special importance in the light of its positive effect on family welfare and, when desired, on fertility decline. Fourth, the primacy of the family as the social and economic unit deserving of and entitled to government support was asserted. Finally, the setting of demographic goals was recommended where appropriate and attention was drawn to the availability of alternative policy options to affect fertility when it was considered either too high or too low.

This paper uses as its organizing principle these five themes. Each expert paper commissioned for the United Nations Expert Group Meeting on Fertility and the Family touches on at least one of these themes; and each is summarized here in the context of the discussion of the themes. The purpose of this paper is not to make recommendations but to assure that the discussion is comprehensive and that it reviews all the major research and policy concerns with respect to fertility and the family that have played an important role in the general debate about these issues in the years since 1974.

* Population Division, Department of International Economic and Social Affairs.

FERTILITY RESPONSE TO MODERNIZATION 1/

In the 1974 World Population Plan of Action,^{2/} much emphasis was given to the interrelationship between population and development and, in paragraph 31, it was recommended that "countries wishing to affect fertility levels give priority to implementing development programmes ... which ... have a decisive impact upon demographic trends, including fertility". In the context of the Plan of Action, "the principal aim of social, economic and cultural development ... is to improve levels of living and the quality of life of the people", (para. 14(a)). The concept of development implied in the language of the Plan included only those aspects of modernization that would result in an increase in individual well-being.

The paper by Moni Nag entitled "Fertility response to modernization" (part Two, II, A) provides a comprehensive overview of the important aspects of modernization which have been found empirically to increase or decrease fertility. In contrast to the view implicit in the World Population Plan of Action, Nag's concept is an empirical one based on actual experience. Thus, the social, economic and institutional characteristics of the now developed countries provide an image of what is modern and the term "modernization" encompasses all aspects of change whether or not the now developing countries experience an improved quality of life as a result of the process.

The 1974 Plan of Action named six development goals in paragraph 32 which were generally agreed to have a moderating effect on fertility. These can be summarized as follows: (a) reduction in infant and child mortality; (b) integration of women in development; (c) promotion of social justice, through more equitable distribution of resources and wider participation in development; (d) the promotion of wide education opportunities for the young and the extension of pre-school education; (e) the elimination of child labour and child abuse and the establishment of social security and old age benefits; and (f) the establishment of an appropriate lower limit for the age at marriage.

In his paper, Nag names eight variables or sets of variables through which processes of modernization can either increase or decrease fertility. These are grouped into factors affecting the demand for children, factors affecting the supply of children and factors affecting the cost of fertility regulation.^{3/} Those variables that are identified as changing with modernization in such a way as to cause fertility decline include: (a) on the demand side, the labour value of children, children's value as old-age support and risk insurance, the economic costs of children and infant and child mortality; (b) on the supply side, age at marriage and proportion never married; and (c) the spread of family planning as it relates to the costs of fertility regulation. These variables that were identified as changing with modernization in such a way as to cause a rise in fertility through their effect on fecundity and/or exposure within marriage include infecundity owing to breast-feeding, malnutrition and disease, post-partum sexual abstinence and widowhood. These variables, although by no means newly discovered, have been

given much attention in the literature in the years since the 1974 World Population Conference with the new emphasis on the "intermediate variables" approach first introduced in the mid-1950s.^{4/} Changes in most of these variables which accompany modernization can be viewed as positive with respect to the quality of life. However, in the case of breast-feeding, the issue is complex because, while prolonged breast-feeding benefits the health of the child and the mother through wider birth spacing, it limits her opportunities for integration into the development process. The following summary of the main points in Nag's paper provides a useful context within which to reassess the concept of development and fertility change implied in the 1974 WPPA.

Aspects of modernization leading to fertility increase

Of the factors reviewed by Nag, breast-feeding has been shown by research to have the greatest potential impact on fertility. The positive effect of breast-feeding on the duration of the period of post-partum amenorrhea is now well-established in the scientific literature. Using contemporary populations at different points of the demographic transition, Bongaarts has estimated that there is on average a difference in post-partum infecundability of roughly 10 months, owing to differences in breast-feeding patterns, when comparing countries at the first and last stages of the transition.^{5/} The reduced incidence and duration of breast-feeding in the process of the demographic transition is estimated to lead to an increase in the total natural marital fertility rate of 4.3 births per woman in the absence of contraception or abortion - a substantial potential fertility effect.

Recent findings from the World Fertility Survey (WFS) data confirm, as expected, that the vast majority of women in developing countries breast-feed their babies (see part Two, II, D), but the duration of breast-feeding varies significantly between regions and between groups within countries. Actual declines in the duration of breast-feeding have been documented in certain developing countries in recent years, while increases in the incidence and duration of breast-feeding have been recorded in the United States of America and other developed regions.^{6/} Nag identifies three major factors affecting the duration and incidence of breast-feeding; (a) the perceptions about its benefits for a child's physical and mental health; (b) the availability and cost of breast-milk substitutes; and (c) convenience and social support of breast-feeding. Modernization affects these factors through change in education, urbanization, women's work, the availability of powdered milk, modern health services etc. Of these, women's work outside the home, education and the availability of substitutes are identified as the most important factors.

Other aspects of modernization leading to fertility increase appear less important than breast-feeding in their net effects, but may none the less be important in particular societies. High levels of primary and secondary sterility associated with sexually transmitted diseases, predominantly gonorrhea, have been found in Africa and the Caribbean, thus leading to the

possibility of fertility increases with improved public health. In certain societies, the practice of post-partum sexual abstinence is common but accumulated anthropological evidence shows a decline in the incidence and duration of this practice in many societies. An improvement in nutrition and a reduction in the incidence of widowhood and/or an increase in the remarriage rate may also increase fertility.

No attention is drawn in the World Population Plan of Action to the fact that certain aspects of development, as discussed above, may lead to an increase in fertility, at least in the early phases of the transition. In addition, it has been found that women with some education often have higher fertility than those with none, suggesting that the promotion of wide educational opportunity, as recommended in paragraph 32(d) of the Plan, may lead to some temporary increase in fertility early in the transition.^{7/} Despite their potential for causing an increase in fertility, however, reductions in malnutrition and disease and in the incidence and duration of widowhood, and the spread of a few years of education can be seen as leading to an improvement in the quality of life. Some reductions in the duration of breast-feeding in societies where it is extended over one to two years may also herald the increased availability of nutritious supplements and greater integration of women in the development process. However, beyond a certain point, declines in the duration of breast-feeding may jeopardize an infant's health, especially among the poor living in insanitary conditions.

Aspects of modernization leading to fertility decline

Most aspects of modernization identified by Nag as leading to fertility decline were more or less covered in paragraph 32 of the WPPA. These include a decline in the value of children as a source of labour and old-age support, an increase in the cost of children, a decline in infant and child mortality and a rise in the age of marriage. Much of the economic literature on fertility in developing countries has focused on the economic costs of and returns from children in agricultural societies. It is clear at the macro-level that, as a society modernizes, the participation of children in the labour force (which is severely underestimated by current international guidelines) declines, school enrolment increases and fertility declines. At the micro-level, there is some controversy in the literature over whether in fact children ever provide net economic benefit to their parents. According to Cain, "the slowly accumulating evidence on child labour suggests that at least as long as children are under the direct control of their parents (the period during which they are actually members of their parents' household) the product of their labour does not compensate for the cost of their cumulative consumption".^{8/} None the less, a decline in the economic contribution of children should decrease the total number of children desired as their net cost rises. Nag cites evidence from recent surveys and village-level studies to this effect. A major consequence of extensive primary school attendance in a predominantly agricultural society is the labour foregone that children

could otherwise provide. Institutional changes in the labour market with the shift of production from the non-market to the market sector are also important aspects of modernization inhibiting child labour.

Support in old age has also been viewed as an important source of economic value in children. Nag cites studies on the value of children as providing convincing evidence that the old-age security value of children, rather than their current work value, is a more important reason for parents wanting an additional child. On the other hand, a village study in India did not find children to be an important source of old-age security,^{9/} partially because high mortality meant that retirement from active life was found to be relatively rare. In fact, in the absence of old-age insurance, the effect of a decline in mortality would be to lengthen the period during which parents would require financial support from their children.

A more general framework within which to view children's economic value is in terms of the insurance they provide against various kinds of risks: both the risks within the family of old age, death, disability and unemployment and the risks that come from outside the family such as natural disasters (droughts and floods) or man-made disasters (wars, lawlessness, crime, etc.).^{10/} In a study of rural India and Bangladesh, it was found that the availability of credit co-operatives and public relief employment schemes as well as the greater access of women to productive employment made village inhabitants in Maharashtra and Andhra Pradesh, India, less vulnerable to risks and thus less dependent on children than villagers in Bangladesh where no such provisions existed.

The main sources of rising costs of children with modernization are educational and opportunity costs in terms of foregone savings, consumption and work opportunities for women. In many developing countries none of these foregone opportunities may seem particularly compelling. Modernization, which brings with it changing aspirations and rising standards, may increase the cost of foregone consumption. Opportunities for investment in children's education or improved agricultural technology increase with modernization. Women's access to employment outside the home will also increase the cost of children if their family members do not readily provide alternative sources of child care.

It has been generally accepted that a decline in infant and child mortality is an important factor in fertility decline. The World Population Plan of Action states that "sustained reductions in fertility have generally been preceded by reductions in mortality. Although this relationship is complex, mortality reduction may be a prerequisite to a decline in fertility" (para. 21). The level of infant and child mortality may affect the demand for births because of the desire to replace children who have died and the desire to ensure the survival of a certain number of adult children. It may also affect the supply through the duration of post-partum lactational amenorrhea. Of these considerations, potentially the most important is the desire for insurance against future uncertainty because it is the only one that affects desired family size and is therefore seen to increase the motivation for

fertility control as mortality declines. The strength of this effect, which is difficult to measure statistically, will depend on parents' perception of a general decline in mortality and the relative importance of children as a source of old-age support. More generally, an environment of greater certainty about the future, which accompanies a decline in mortality, will increase parents' motivation for fertility control as they recognize the opportunity to chart their own futures and make greater commitments through education and other investments in their living children.

A recent study based on WFS data concluded that the direct effect of an actual child death in a family on subsequent fertility was roughly one-half a child, but the study did not attempt to measure the long-term effects of changes in perceived mortality levels on fertility. (See part Two, II, E). Some decline in mortality can occur without modernization both through the massive transfer of modern techniques of public health control from the developed countries and through the better use of locally available materials to combat the effects of certain diseases. However, improved nutrition and modern public health services require sustained increases in education and income which can only come through economic development.

Increases in the age of marriage have been found to be an important factor in fertility decline in many Asian countries. Modernization, in the context of today's developing countries, is viewed by Nag as increasing the average age of marriage through, on the one hand, an erosion of traditional institutions which promote early marriage and, on the other, increases in educational and employment opportunities. However, Nag cites examples of three societies (China, Sri Lanka and Kerala - a province in India) where the age of marriage is known to have increased without a significant improvement of economic conditions. Evidence from WFS data, on the other hand, suggests that, in some countries in Latin America where consensual unions are prevalent, age at union (defined to include consensual unions) may not have increased noticeably in recent years despite rising levels of educational attainment.^{11/}

Evidence from WFS data relating parity of older women who have completed childbearing to age at first union suggests that it is only when marriages are delayed until the early twenties or older that significant reductions in fertility take place.^{12/} What this implies is that legislation setting a minimum age at marriage of 17, or even 19 or 20, is unlikely to have a significant effect on fertility even if fully enforced, whereas modernization and all the changes it brings with it are likely in many cases to result in a shift in the whole marriage age distribution thus leading to fertility decline. It should be remembered, though, that in much of Africa and Latin America, premarital fertility is not uncommon;^{13/} thus, the observed relationship between age at union and fertility noted above does not necessarily express a causal relationship because age at union does not always measure exposure.

The final aspect of modernization leading to fertility decline is the reduction of fertility regulation costs that accompany the introduction of family planning programmes and advanced contraceptive technology, as outlined

at the beginning of this section. The final section of Nag's paper is devoted to this topic, which will be discussed in the final section of this paper titled "Demographic goals and policy alternatives".

CHOICE WITH RESPECT TO BEARING OF CHILDREN--
ALTERNATIVE APPROACHES

The World Population Plan of Action "recognizes the necessity of ensuring that all couples are able to achieve their desired number and spacing of children" (para. 28). This statement presupposes that couples have clear fertility preferences both as to family size and as to spacing. It also requires that all couples have the education, information and access to whatever means are necessary to achieve these desires. Governments desirous of altering fertility can institute policies designed to affect fertility desires if these are perceived to be too high or too low. They can also increase access to information and education about population and family planning services in order to reduce unwanted births. Thus, policy design requires an understanding of fertility decision-making; i.e., the factors affecting the formation of fertility preferences and the process by which these preferences are translated into the demand for family planning services when fertility desires fall below the level of natural fertility and/or when spacing is desired.

The paper by Rodolfo Bulatao entitled "Content and process in fertility decisions" (part Two, II, B) provides a comprehensive overview of all aspects of the fertility decision. The author begins with a review of all the factors that affect decisions, emphasizing parents' perceptions of the values and disvalues of children on which family-size desires are based. He points to the importance of the decision-making process itself in the actual determination of family planning choices and fertility outcomes and discusses alternative decision strategies. Using roughly the same framework as Nag, he focuses particularly on alternative decision strategies when fertility desires fall below perceived childbearing potential and thus, on objective grounds, fertility regulation would appear indicated.

In the simple economic theory of decision-making, including the economic theory of fertility, couples maximize well-ordered preference functions subject to time and financial constraints. In this approach, the theory of taste formation is not developed and tastes are assumed stable as economic factors change. Desired family size changes as time and/or financial resources change and as the cost of child-rearing changes relative to alternative family goals. The Easterlin model of fertility decision-making has expanded on this with an attempt to get at the formation of tastes.^{14/} In his model, aspirations for a certain standard of living are developed from childhood experience. In an alternative formulation by Caldwell, tastes can be changed in adulthood through the influence of media images and the importation of Western culture.^{15/} In Bulatao's framework, tastes and economic constraints are not clearly separable. Values and disvalues of

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children include both objective and subjective elements. In all of these approaches, however, there is the recognition that values, attitudes and beliefs, on the one hand, and objective economic circumstances, on the other, interact to determine family-size desires.

The importance of the social and cultural context within which fertility decisions are made is illustrated in McNicoll's paper.^{16/} Institutional forms and cultural patterns circumscribe the scope of fertility decisions and provide the structure within which they are developed. The characteristics of the community and its important functioning units (political, economic, kinship networks) can be important factors in fertility.

The independent importance of the decision-making process itself to the final outcome is highlighted in Bulatao's paper. When supply exceeds demand by a certain amount, different outcomes are possible, depending on which of five strategies are adopted: denial, passive acceptance, active coping, advanced coping or sequential coping. According to Bulatao, the first two involve a failure to act on an actual imbalance between demand and supply either because of misperception, rationalization or inaction. The latter three strategies involve taking some action, the degree depending on the extent of the imbalance between supply and demand. The first two strategies - denial and passive acceptance - may result from an absence of information and education on which family size desires can be more accurately based, and information and education about the availability and means of fertility regulation. Thus, Bulatao's paper calls attention to the importance of information and education as specified in the Plan of Action.

Freedom of choice

The right to freedom of choice in reproduction is one of the rights laid out in the Plan of Action, i.e., "the right of persons to determine in a free, informed and responsible manner, the number and spacing of their children" (para. 29(a)). This presupposes an active decision-making strategy in which the couple has some autonomy within the larger context of family, household, kinship network and the community. It also presupposes some equality between the sexes, that husbands do not impose their will on their wives.

In Caldwell's theory of high fertility,^{17/} much weight is given to the family patriarch whose desire for a large family for economic and political reasons is seen to influence fertility decisions within the larger family network. Thus, in this view, the real decision-maker is not seen to be the couple itself. There is much debate in the literature on this point, but it seems certain that the patriarchal-family paradigm is not applicable in many developing societies. Cain points out that in a high risk environment, women themselves have a strong incentive for high fertility, and may well play an active role in maintaining high rates.^{18/}

Fertility surveys in recent years have solicited information on fertility preferences posed in the form of questions on ideals or desired family size or, alternatively, in the form of a question such as "do you want to have any more children?" Among 23 developing countries, a majority of women respondents to WFS questionnaires were able to give a number in answer to a question on desired family size in most cases.^{19/} The ever-married women who failed to give a number made up less than 3 per cent in the majority of countries. Only in Bangladesh and Kenya did a significant minority of women give no figure (30 and 19 per cent respectively). While it is highly likely that many women may rationalize their actual family size in stating their fertility preferences (as evidenced by a high correlation between actual living children and stated desires), a majority of women did state fertility desires distinct from their actual family size, suggesting that the response was given some thought.

It has often been assumed that women in developing countries do not adopt contraception until they have achieved their desired family size, and calculations of "unmet" need for family planning often include only exposed women who want no more children. However, evidence from WFS data suggests that a large proportion of contraceptive users adopt family planning for spacing purposes. By giving each of 27 countries equal weight, it was found that roughly 35 per cent of all contraceptive users were women who wanted more children.^{20/} There is no way of knowing, using current survey data, the extent to which clearly formulated preferences for birth spacing exist, or the extent to which they are realized given breast-feeding patterns and contraceptive availability. None the less, it is important to note that child-spacing is an important way in which women can improve their children's and their own health and gain some control over their lives, and it is a factor that has often been neglected in the assessment of potential demand for family planning services.

Information and education

Information and education are crucial inputs into the decision-making process, particularly in an area such as reproduction and contraceptive use, because of sexual taboos and concern for privacy which seriously hamper the normal flow of information through informal networks. The World Population Plan of Action makes recommendations in both these areas. With respect to education, Governments should consider "making provision, in both their formal and non-formal educational programmes for informing their people of the consequences of existing and alternative fertility behaviour for the well-being of the family, for educational and psychological development of children and for the general welfare of society ..." (para. 33). The WPPA makes no mention, however, of the importance of sex education, which is acknowledged to play an important role in equipping adolescents to deal responsibly with their emerging sexuality. By the early 1980s, national level school-based population education programmes were developed in 12 countries in Latin America, 9 countries in Africa, 6 in the Middle East and 11 in Asia.^{21/}

In a few of these countries, which are actively seeking to reduce fertility (i.e., Indonesia, the Philippines, the Republic of Korea and Singapore), education programmes have been used to develop popular support for government programmes.^{22/} In general, however, progress in developing population education has been slow. The high drop-out rate after primary schooling in many countries makes it difficult to reach the majority of students.

The level of knowledge of family planning methods, in particular modern contraceptive methods, has been found to be very high in most developing countries as evidenced by recent WFS survey findings of the 29 countries for which data are currently available. In all but four countries, at least 75 per cent know of some method and also know of at least one modern method.^{23/} However, it is not known to what extent the information component of national family planning programmes has contributed to this widespread knowledge. In some countries, many women who do not know of a family planning outlet practice contraception, but the level of use is generally much higher among those who know of an outlet.^{24/} Of course, women who are highly motivated to use contraceptives may have sought out information about services, but there is also evidence that the objective (as opposed to the perceived) availability of services in an area can have a large influence on the level of contraceptive practice.^{25/}

The Plan of Action urges Governments to "ensure that information about and education in family planning and other matters which affect fertility are based on valid and proven scientific knowledge, and include a full account of any risk that may be involved in the use or non-use of contraceptives" (para. 29(g)). Although no surveys have been taken on this subject, it seems that information about serious risks attached to different methods is not widely available in developing countries. A World Health Organization (WHO) study shows that the methods offered and currently in use are often not the ones that would be chosen, given a wide choice of and information about each method.^{26/} However, it is a matter of concern that there is a lack of scientific understanding of the long-term effects of the newer hormonal methods in particular on the health of both women and nursing infants.

In developed countries where general levels of education are higher and scientific information is widely available, the serious side-effects of certain modern methods have led to a decline in their use.^{27/} Without further advances in contraceptive technology, this could also happen in some developing countries as education and information improve.

As stated in Bulatao's paper, there is much room for appropriately designed communications programmes to influence individuals' perceptions about the factors that influence decision-making, both the content of decisions, and the process by which they are reached. Given low levels of education in developing countries, perceptions and reality may diverge sharply. Governments, through information and education policies, can help to bring perceptions and reality closer and provide the means for couples to decide on family size.

REPRODUCTIVE AND ECONOMIC ACTIVITY DURING FEMALE LIFE CYCLE

Even before the World Conference of the International Women's Year in Mexico City in 1975, the right of women to equal status with men and their central role in the development process had been strongly asserted in the International Conference on Human Rights held in Teheran in 1968 and in the 1974 World Population Plan of Action. The Plan of Action recognized that "the improvement of the status of women in the family and in society can contribute, where desired, to smaller family size, and the opportunity for women to plan births also improves their individual status" (para. 43). Although equal status is never exactly defined, it is clear from an analysis of the recommendations that this includes the full participation of women in education, training, employment (in particular non-agricultural employment) and development planning as well as from the passage and enforcement of the Convention on the Elimination of All Forms of Discrimination against Women and other relevant legislation.

Nadia Youssef in her paper prepared for the Expert Group Meeting, "Sources of variation and change in the share of women's productive lives devoted to childbearing" (IESA/P/ICP.1984/EG.I/13), illustrates very clearly the important connection between the duration of the childbearing period and the share of women's active lives potentially available to other pursuits. Using as examples WFS data from 10 countries drawn from each of the major regions of the developing world, she illustrates the substantial number of women's prime years that are engaged in childbearing (measured as the difference between the date of the first and last birth) in selected developing countries. This represents two to three times as many years as women experience in childbearing in the United States of America. For women aged 40 to 49, the mean interval between first and last birth ranges from roughly 14 to 18 years in these 10 developing countries, while it is roughly 7 in the United States. Given large differences in life expectancy, the difference between developing and developed countries in the proportion of women's total active lives devoted to childbearing is even more extreme.

There is much to indicate that the age of the youngest child is an important determinant of the time allocation of mothers.^{28/} Evidence from WFS data indicates that in most cases, women's work rates increase as the age of the youngest child increases.^{29/} Thus, the span of time between the first and last birth roughly encompasses the period in which child-rearing demands the greatest time commitment. Obviously, many women work even during this period, although they are more likely to engage in work at home or near home as part of a family business or farm - work that is relatively compatible with childbearing. In many countries, such activities are not even recorded as work. Thus, alternative options to a lifetime of motherhood cannot be realistic for the majority of women unless mortality falls and the childbearing span shrinks.

Youssef points to several important variables that influence the length of the childbearing interval: i.e., age at marriage, age at first birth and educational attainment. Although delayed marriage leads women to have their last birth at slightly older ages, the mean duration of the childbearing interval is on balance significantly shorter for those marrying at ages 25 and over compared with women marrying at ages less than 20. Youssef also found that, when comparing women with different levels of educational attainment, childbearing intervals were not significantly shortened until relatively high levels of education (7 to 9 or 10 plus years) had been obtained.

Work experience before marriage is also an important factor influencing the age at marriage and the likelihood of work experience after marriage. Evidence from a United Nations working paper, which examined patterns of work in several WFS countries, shows that women with pre-marriage work experience have a greater likelihood of working after marriage.^{30/} The type of work they do also influences age at marriage (other things equal), with those experienced in professional and clerical occupations having the oldest age at marriage and those in agricultural occupations the youngest.

Despite trends towards a later age at marriage in many developing countries, the average age at first birth has apparently changed little except in a few Asian countries where the mean age at marriage has reached 23 years or more.^{31/} However, there is substantial variation across countries in the mean age of initiation into childbearing. According to one study, among the 20-24 age cohort, the mean age at first birth ranged from 17.6 in Bangladesh to 27.1 in Korea, using data from 19 WFS countries based on the date of interview.

Trends in educational attainment among ever-married women can be gleaned by comparing differences in educational attainment for different age cohorts from WFS data. Youssef summarizes three major trends: (a) a dramatic decline in the proportion of women who have had no schooling, (b) significant increases in the proportion of women who now have some or complete primary education and (c) some progress in secondary and higher education in particular countries. As the educational distribution shifts, the mean duration of childbearing intervals will undoubtedly decline, but how important this will be is difficult to judge from evidence on cross-sectional differentials in the mean length of childbearing by education.

Various policy strategies that would shorten the childbearing interval are familiar and have already been discussed above in the context of the effect of modernization on fertility. Both general socio-economic policies that reduce family size desires and family planning policies that reduce the cost of fertility regulation will inevitably result in a shortening of the childbearing interval primarily through termination of childbearing at a younger age. None the less, these effects may develop slowly and, meanwhile, women's options continue to be limited by the period of their active lives consumed in childbearing. Youssef focuses attention on the need to design realistic options for women at potentially crucial turning points in the life cycle which would provide practical alternatives to reproduction. She

identifies two target groups: the unmarried woman and the married woman between ages 25 and 30 years. The latter group is particularly important because there is much evidence to suggest that the age at first birth is not readily susceptible to change at least in the short run within countries. In the education and training area, she recommends alternative policies outside the formal educational structure to reach adult women not reached by the formal system and to teach practical marketable skills tailored to the needs of the local economy. In the area of employment/income generation, the development of new options is recommended which do not rely entirely on the formal modern sector of the economy where job openings are limited. Specific suggestions along these lines are included in the paper.

The experience of the developed countries has shown a rapid increase in the participation of women in the labour force occurring during a period of falling birth rates. The Economic Commission for Europe (ECE) paper submitted to this Expert Group Meeting (see part Two, II, C) shows that fertility differentials by women's work are the most significant of all fertility differentials in the data for Western Europe. Thus, work in a more developed setting appears to be competitive with time needed for child-rearing, particularly in the context of a traditional division of labour between the sexes at home. Despite rapid advances in the participation of women in work, however, they have not achieved fully equal status with men in any developed country, notwithstanding legislation mandating equal pay and disallowing discrimination.^{32/} Whether Governments view fertility as too high or too low, the attainment of sexual equality should further fertility goals. In a developing society where women are economically dependent on men and where traditional work does not conflict with motherhood, many women have an incentive for high fertility. On the other hand, in a developed society where work and motherhood are difficult to co-ordinate, the maintenance of a traditional division of household responsibilities by sex, combined with work outside the home, leaves women overburdened and with an extremely low incentive for fertility.

THE RELATIONSHIP OF FAMILY TYPES, STRUCTURE AND FUNCTION TO FERTILITY LEVELS AND CHANGE

The family remains central to reproductive decisions in most societies, but family types and structures vary widely across societies in important ways that are not yet fully understood. The World Population Plan of Action recognizes the family "as the basic unit of society" but the word is not defined (paras. 14(g) and 39). The word in common usage is an ambiguous one and may include those living in the same household, parents and their children, those related by blood or marriage and those descended from the same ancestor, tribe, clan, etc.

Many theories of fertility centre on the structure of the family as an institution and its peculiar role in setting the context within which reproductive decisions are made. In a traditional society, the family in its broadest sense represents the locus for many types of economic and social

transactions. In each particular social setting, the family functions within the context of certain implicit understandings about the rights and responsibilities of children to parents and parents to children or what Ryder has called, "the intergenerational contract".^{33/} In his view, in societies with high mortality, children represent the kinship group's sole source of investment and where there is high risk and uncertainty about the future, children must be relied on to provide resources to their parents. Thus, in his view, high fertility in such settings is economically advantageous. This view, however, ignores the potential importance of land ownership as a source of income and security, and the availability of non-family labour as a productive input. With the development of a market economy and a modern state with laws governing social relations and economic transactions, there is a gradual shift in power away from the family towards the individual, on the one hand, and the larger society, on the other.^{34/} Families become less important as the principal institution through which economic transactions are arranged. Increased opportunities for training and investment decrease what children can contribute to the family and increase their potential demand on family resources. Thus, intra-familial flows of wealth are reversed,^{35/} and family size desires decline.

There is currently much debate in the literature about whether the process of transition to low fertility is essentially the product of economic or social change. In Caldwell's theory, the social transformation of the family is a prerequisite for fertility decline and economic change alone is not sufficient to bring this about. The social transformation of the family in Caldwell's view involves a change from extended kinship networks, in which emotional bonds between spouses and between parents and children are weak and the power of the older male patriarch is strong, to the nuclear co-residential family.^{36/} However, on the basis of village case studies, Cain points out that in some Indian villages, strong extended family networks which provide insurance against risk, can facilitate fertility decline when economic conditions warrant it; whereas, the nuclear family structure predominating in a poor village in Bangladesh provides no protection against risk and a continued incentive for high fertility.^{37/} Thus, Cain indicates that family structures vary among poor villagers in Asia and that, at least in certain cases, the extended family network does not provide a barrier to fertility decline. He also points to the strong incentive for dependent wives to have many children as risk insurance in a predominantly nuclear family pattern in Bangladesh.

Although family structure is generally accepted as a central aspect of fertility decision-making, little is actually known about the nature and variety of the influence of extended kinship structures on fertility decisions or about the adaptability of these structures to economic change. This is an extremely difficult area of research and one that has not yet been fully explored empirically. For example, the WFS did not include questions on family structure at crucial points in a woman's cycle but only listed a household roster classified by age and sex (plus some detail on family relationships) as part of the household survey. In addition, even if information about past living arrangements had been collected, it would only

have told about certain demographic characteristics of people sharing the same household and would not have told about important family ties that extended beyond the residence unit. Although theories have been developed that contrast extended kinship structures with the co-residential nuclear family as an idealized type, it is clear that family types could also be classified according to the division of labour between the sexes as well as according to types of established intergenerational relationships. Youssef has pointed out that a motivation for high fertility may be a rational response by women to the heavy workload imposed on them in certain agricultural settings by the intra-familial labour allocation process. In this view, children provide a means of spreading that burden.^{38/} There is no consensus at present as to which aspects of family organization are most important for an understanding of fertility patterns nor is there a consensus about how to measure many of the influences that have been hypothesized.

One important family type which has only recently received attention in the literature is the female-headed household. The idealized image of the Western nuclear family with a male household head and a dependent wife and children is rapidly evaporating as it is becoming more and more apparent that female-headed households form an important percentage of all households in many Western countries.^{39/} The idealized image of the extended family in the developing world is one of a small welfare system that provides all kinds of protection and economic support for its members, in particular for women regardless of their marital status.^{40/} This image, although still prevalent, has also been recently subject to question. Rising numbers of female-headed households in developing countries can be attributed to various stresses and strains of the modernization process in which migration, urbanization, agricultural mechanization have forced the separation of spouses. Such abrupt changes in family composition may cause major stresses in women's lives because, although, on the one hand, female-headship may mean reduced exposure to the risk of pregnancy,^{41/} on the other hand, increased poverty and economic vulnerability will increase family size desires to achieve insurance against future uncertainties. These changes may also severely tax the capacity of the extended family structure to deal with the economic demands that such changes entail.

The Caribbean is a region that is known for a variety of union patterns including consensual and visiting unions and for a high degree of instability with respect to partners, which results in high rates of female-headship. On the one hand, a high degree of instability with respect to partners reduces exposure to the risk of pregnancy over the life cycle, but, on the other hand, multiple partners may increase desired family size because of the wish to bear children with each partner. There is evidence of both of these effects in a study of marital unions and fertility in the West Indies.^{42/}

Regardless of whether the prevalent family structure is nuclear or extended, it is important to recognize that in certain developed and developing countries, the proportions of children born out of unions are not trivial. In certain social contexts, however, an extra-union birth will none the less be accepted within a larger kinship structure or ultimately become

part of a legalized union at a later date. On the basis of relatively generous definitions of unions, which included consensual or free unions in countries of Latin America and Africa, WFS data revealed that while 98 to 99 per cent of recent births in some Asian countries occurred within unions between 4 and 14 per cent of births took place either before first marriage or after a marriage had dissolved in certain African and Latin American countries as well as in Fiji.^{43/} In addition, it is interesting to note that formerly married women generally had much higher age-specific fertility rates and in some countries contributed more births than did single women. Per year of exposure, fertility rates of formerly married women (excluding periods within nine months of the disruption) were between 20 and 40 per cent as high as marital fertility rates in six of the eight Latin American countries and were between one half and two thirds as high as rates of marital fertility in Kenya and Lesotho.

Non-legal unions, marital instability and extra-union fertility have all become increasingly prevalent in recent years in developed countries in a context of high standards of living and extremely low fertility. Patterns of family formation in Europe since 1900 can be divided into three major historical phases: (a) late marriage and a non-trivial rate of non-marriage at the beginning of the century; (b) a decline in the age of marriage, an increasing rate of marriage and a rise in the divorce rate; and (c) a decline in the annual number of marriages and a rise in divorce.^{44/} This does not imply, however, that more and more younger people are living alone. On the contrary, the increased prevalence of cohabitation without official marriage means that, if anything, the proportion of young people living in either a legal or non-legal union has continued to rise. In certain countries, in particular Denmark and Sweden, the desire for childbearing no longer affects the likelihood of marriage. However, in France and Germany, the desire for children still provides a major incentive for marriage. At this point it is unclear whether Denmark and Sweden represent a vanguard in a new phase or will remain aberrant cases.^{45/}

These recent changes in family structure in Europe and the United States herald a new phase in the evolution of the family. The extremely low levels of fertility in these countries may have played a contributing role in facilitating these changes. Thus, it is more than likely that the relationship between family structure and fertility is not uni-directional. In fact, demographic change itself, often stimulated by the process of development and economic change, is a contributing factor in shaping the structure of the family.

DEMOGRAPHIC GOALS AND POLICY ALTERNATIVES

Population policy with respect to fertility change includes all government measures specifically designed to affect the level of fertility, either because it is seen to be too high or too low, or to maintain the level of fertility if it is viewed as satisfactory. Countries with no expressed

wish to alter fertility levels may none the less support policies that have an indirect effect on fertility because they have other goals such as economic development, health (another demographic goal), the status of women and/or income distribution, among others, in mind.

In the following discussion of policy alternatives in the context of demographic goals, options such as coercion and legal sanctions, although known to exist in certain contexts, will not be discussed since they clearly violate one of the basic principles universally espoused in the World Population Plan of Action, i.e., "all couples and individuals have the basic right to decide freely and responsibly the number and spacing of their children and to have the information, education and means to do so; ..." (para. 14(f)). Thus, the main policy options considered here will be family planning programmes, economic incentives and disincentives and more general socio-economic measures such as those proposed in paragraph 32 of the Plan of Action. It should be emphasized that family planning programmes not only serve the goal of reducing fertility, but can also be viewed more broadly as an important element in policies relating to mortality and health. Although primary attention will be given to the problems and policies of developing countries, the special problems of certain developed countries which view their fertility as being too low will also be considered.

Demographic goals and target groups

The 1974 Plan of Action called on Governments that consider "their birth rates detrimental to their national purposes ... to consider setting quantitative goals and implementing policies that may lead to the attainment of such goals by 1985" (para. 37). As of 1980, 58 of the 126 developing countries considered that their fertility rates were too high; 51 of these gave direct support for programmes providing effective means of fertility regulation. Of these, 23 countries had set quantitative population targets either in the form of overall growth rates or fertility rates. These 23 countries represented 72 per cent of the population living in the developing world.^{46/} On the other hand, 22 countries (10 developed and 12 developing) viewed their fertility levels as too low. Of these, three had set quantitative goals.

Once goals have been set, the question arises as to whether policies devised to that end should treat all families and individuals equally or focus in particular on certain population groups. The World Population Plan of Action suggests that countries desiring to reduce their birth rate "give particular consideration to the reduction of fertility at the extremes of female reproductive ages because of the salutary effects this may have on infant and maternal welfare" (para. 38). Given the rapid growth of young persons in many populations (see para. 64 of the Plan of Action), it is important that family planning services be accessible to all groups without regard to age. As already noted in the section above, on choice with respect

to childbearing, the mean age at first birth varies widely across countries. Given the special needs and problems of the young, it may be necessary to design special information and education programmes specifically for them.

From the earlier discussion on the family, it is clear that not only are consensual unions a prevalent family type throughout Latin America and parts of Africa, but that they are a growing phenomenon in Europe and North America. In addition, even when a broad definition of union is applied, there is evidence in certain countries that extra-union childbearing is not uncommon. In countries where fertility is considered too high, the family planning needs of couples in stable unions may differ from individuals who are not in such unions, both in terms of the choice of methods and of their alternative costs. In addition, whether countries are interested in raising, maintaining or lowering their birth rate, parents, regardless of marital status, should be entitled to government services as well as various kinds of benefits. In countries with low fertility, it was recently recommended at the September 1982 Council of Europe European Population Conference that "children whose parents have chosen not to enter into a legal marriage should not suffer any discrimination because of their parents' status".^{47/}

From a different perspective, Youssef in her paper identifies certain target groups for socio-economic policies (i.e., education/training programmes, employment/income generation programmes) with the object of providing options for women alternative to mothering at crucial points in the life cycle. Her particular concern with unmarried women and women aged 25 to 30 years is because these groups might be most receptive to information, education and training opportunities which would give them a productive role to play in the development process. This is consistent with other sections of the WPPA, which calls for Governments to "ensure full participation of women in the education, social, economic and political lives of their countries on an equal basis with men" (para. 41).

There is also evidence from WFS data that in developing countries that have achieved relatively high levels of educational attainment, illiterate women have extremely high fertility (even higher than illiterate women in other developing countries) which is likely to be a result of their disadvantaged position.^{48/} Thus, equal access to education for all, regardless of socio-economic class, is an important goal in its own right which should have significant demographic impact in rapidly developing countries seeking further fertility declines.

While individual reproductive rights should be respected, it must be clear in designing population programmes that certain demographic groups have particular needs and problems, as discussed above. In addition, certain groups (such as married women and women aged 25 to 30 identified by Youssef), because of their social and economic circumstances, may be more responsive to government measures and therefore require special attention in the design of policies and programmes to affect fertility.

Family planning programmes

Of the 126 developing countries, 80 have official family planning programmes and 14 additional countries provide indirect support to private or semi-governmental agencies for the diffusion of information on the methods and use of modern contraception.^{49/} It is important to note, however, that many family planning programmes have been introduced in the interests of maternal and child health rather than as a means for achieving fertility decline. Only 58 of the 81 countries with official family planning programmes consider their fertility too high; only 9 developing countries restrict access to family planning services. Together, these countries represent only 1 per cent of the population in the developing world. Among the developed countries, only Malta and the Holy See officially restrict access to family planning services, but restrictions on the importation of modern contraceptives effectively limit access in some Eastern European countries as well.

Given the extensive investment made by national Governments and international donors in family planning programmes, it is important to determine the impact of these programmes on fertility and also on human rights and on maternal and child health, both of which are priorities in the World Population Plan of Action. In addition, as W. Parker Mauldin makes clear in his paper "Measuring the impact of population policies and programmes on fertility" (part Two, IV, B), the evaluation of the effectiveness of family planning programmes is an important input into improving that effectiveness. To date, family planning evaluation has focused on the overall impact of programmes on levels of contraceptive use and on fertility, without attempting to isolate the relative contributions of different programme components or to assess other programme outputs (i.e., health, human rights). There is now an extensive literature on the methodology of evaluating family planning programmes,^{50/} and many alternative techniques have been applied in individual countries. Despite the incomparableness of programmes and research methodologies, it can none the less be confidently stated, as Mauldin does, that "there is considerable empirical evidence that large-scale family planning programs, when well managed, have a substantial effect on fertility independent of the influence of socio-economic factors". In the past 10 years, certain countries, such as China, Indonesia, Sri Lanka and Thailand have achieved impressive fertility declines despite low levels of per capita income and a predominantly rural population. Although the independent effect of family planning programmes on fertility decline has been clearly established, less is known about the effect of programme design and the relationship between particular types of inputs and outputs. The many elements required for an effective family planning programme include an information programme, a good delivery system, a medical referral system, trained personnel etc.

The fact that many women in developing countries that have family planning programmes are not using contraceptives despite their awareness of modern contraceptives and their attainment of expressed desired family size suggests that the effectiveness of programmes could be improved.^{51/} In

addition, the unfulfilled demand for contraceptives for purposes of child-spacing is poorly known. None the less, it is doubtless true that the provision of information about birth spacing and its benefits would enhance the effectiveness of programmes.

One of the most important provisions in the World Population Plan of Action with respect to family planning programmes is paragraph 30 which invites Governments with family planning programmes "to consider integrating and co-ordinating these services with health and other services designed to raise the quality of family life, ... and to consider including family planning services in their official health and social insurance systems". Since 1974, international meetings have emphasized the importance of primary health care and community responsibility in the design and delivery of services.^{52/} To the extent that widespread maternal and child health networks exist, the integration of services has not been difficult to facilitate. The more difficult problem is in countries where access to services is limited because of the difficulty of extending services into the rural areas. Although services may be integrated to the extent that they exist, the necessary financial resources, trained personnel and infrastructure may be lacking. Prevalence rates estimated from WFS surveys show that in countries such as Indonesia, with community-based programmes, and Costa Rica and Sri Lanka, with programmes that are fully integrated with maternal and child-health services,^{53/} the urban/rural differentials in contraceptive use are relatively narrow.^{54/} This suggests that improvements in accessibility and in responsiveness to community needs may result in a narrowing of the substantial socio-economic differentials in levels of use.

Particular areas of concern in the family planning literature include the accessibility of modern methods and the mix of family planning methods. These factors affect the costs (physical, psychic and monetary) of fertility regulation and thus its use (see IESA/P/ICP.1984/EG.I/24). Easy access to services requires relatively low-cost services, on the one hand, and a good distribution system, on the other. It has been estimated that the yearly private sector cost for the four most popular methods ranges from \$ 23 to \$ 34, a relatively high figure if measured by per capita income in developing countries.^{55/} Thus, without government subsidies and reduced fees, accessibility may be limited. Widespread accessibility may often require a large financial commitment by Governments and international donors. Economies of scale can be reaped in the distribution of services by sharing overhead and professional personnel with community health centres. Costs can also be minimized by involving community groups.

In some developed countries, the problem of the accessibility of modern methods may take a somewhat different form. In Bulgaria, Romania and Yugoslavia, over 70 per cent of those currently employing birth control are applying traditional methods such as rhythm and withdrawal in the context of relatively high overall levels of contraceptive use, ^{56/} suggesting that supplies are not readily available, are of poor quality or are for other reasons unacceptable. Albania and Romania neither import nor produce locally any modern contraceptives.^{57/}

In addition to the monetary costs, which can be shared in various ways by Governments, individual users and international donors, there are psychic and health costs which can only be borne by the individual user and which vary from method to method. In the United States, knowledge of the health risks associated with certain methods (oral contraceptives, IUDs and injectable contraceptives) has reduced their use in recent years in favour of less hazardous methods (i.e., sterilization and the diaphragm). On the other hand, evidence does suggest that women in developed countries have a high tolerance for minor side effects.58/

In the developing countries, however, questions about possible health hazards have not had much effect on the pattern of use of particular methods, partly because of less rigid drug-regulating policies and related screening requirements and partly because levels of knowledge about health and science are low among the majority of people. Depo-Provera, a injectable hormonal contraceptive which is estimated to be in use in roughly 70 developing countries, has not yet been approved by the Food and Drug Administration for use in the United States but has received the endorsement of a Toxicology Review Panel of the WHO and a Medical Advisory Panel of the International Planned Parenthood Federation.59/ Questions about the drug's safety remain at the centre of the continuing controversy surrounding its use.

In most family planning programmes, choice of method is limited, and information about serious health hazards and about the degree of uncertainty regarding long-term effects of specific methods is not routinely provided to prospective users.60/ None the less, uninformed fears about serious effects abound and often lead to the discontinuance of a method because its minor side effects are not well understood by users. As long as real and imagined fears about the long-term health costs of modern contraceptive methods reduce their levels of adoption and continuance, abortion will be an option chosen by many women attempting to avert births, an option with extremely high health risks when performed illegally, in insanitary conditions and/or with untrained practitioners. However, it is important to recognize that even if contraceptives had no long-term health risks, the demand for abortion would exist because all family planning methods have a certain failure rate.

Clearly informed decision-making requires balanced information about minor side effects and major health hazards associated with all family planning methods including abortion, and the health risks of pregnancy itself as they relate to the individual's age, parity and medical condition. In addition, as stated in the International Development Strategy for the Third United Nations Development Decade adopted by the General Assembly on 5 December 1980, "due consideration should be given to the need for increased biomedical and social science research into safe, more efficient and more widely acceptable techniques of fertility regulation".61/

Incentives and disincentives

Economic incentives and disincentives are increasingly used by Governments that are unsatisfied with their current levels of fertility in an attempt to alter the individual couple's calculus of costs and benefits of childbearing and/or contraceptive use. Of the 22 Governments that view their current fertility levels as too low, 17 have designed various legal and/or economic interventions to increase them.^{62/} In many developing countries, these economic incentives have become quite elaborate, particularly in Eastern Europe. The World Population Plan of Action recognizes the existence of such schemes in paragraph 34 but states that "if such schemes are adopted or modified, it is essential that they should not violate human rights". In many Eastern European countries, an extensive system of progressive (i.e., increasing cash entitlements at increasing parity) family allowances, birth payments and paid leave attempt to create a favourable economic environment for parents to raise two or three children.^{63/}

Family allowance and other such measures may also be adopted by Governments for purposes of redistributive equity, but in such cases there would be no reason for benefits to be tied to parity. As presently stated in paragraph 35 of the Plan of Action, "some social welfare programmes such as family allowances and maternity benefits, may have a positive effect on fertility and may hence be strengthened when such an effect is desired. However, such programmes should not in principle, be curtailed if the opposite effect on fertility is desired".

In a number of developing countries, most particularly in Asia, many incentive and disincentive schemes have been adopted to induce family planning, particularly permanent or long-term methods such as sterilization or the IUD, or to decrease family size desires,^{64/} such as the extensive package of economic measures adopted in many Chinese provinces to encourage the one-child family. The provision of free contraceptive supplies and services is the most basic form of economic incentive because it involves a reduction in price and is in common practice. In addition, financial rewards can be provided to the provider of services and those that accept family planning. However, incentives to the providers of service may create an atmosphere in which the provision of complete information about the health costs and minor side effects of different methods is not encouraged, and this is of particular concern in the case of sterilization, which is largely irreversible.

Alternative incentive schemes focusing on delayed marriage or the avoidance of pregnancy involve deferred payment in the form of such provisions as pension programmes, savings deposits etc., and they have been experimented with in some countries of Asia. Disincentives in the form of economic penalties to large families are much less common and require a context in which are family planning methods, including abortion, are readily available.

An interesting example of an incentive scheme that is integrated into community development can be found in Thailand.^{65/} There, family planning services operating at the village level are used as a springboard for

income-generating or other partially self-financed productive activities. This is a creative effort to spur community development in accordance with local needs, resources and customs by facilitating access to markets, the acquisition of livestock, fertilizers etc., for those accepting family planning services. Various types of incentive schemes will continue to abound and are most likely to have their desired effect on fertility in the context of community development, political stability, and a free flow of information about the availability and characteristics of different methods. However, it must be recognized that these schemes may be extremely expensive, both in the developed countries where child-rearing costs are extremely high and in the developing countries which have large numbers of families in the child-bearing years, and more limited funds available.

Socio-economic measures

More general socio-economic measures can also be seen as part of a set of policies affecting fertility. Changes in child labour laws, compulsory education laws and social security provisions would be some of the types of legislation included in this category. Educational investments, promotion of training opportunities for women, extensions in maternal and child health care are all examples of the types of social investment suggested in paragraph 32 of the World Population Plan of Action, which have been fully discussed above under "Aspects of modernization leading to fertility decline".

In the case of legislation, it is important to recognize that behaviour will not necessarily change because a law is passed. It is either necessary to have extensive enforcement or to have the underlying socio-economic conditions favourable to compliance. Social security and old-age benefits require a sophisticated bureaucracy and a large financial commitment as well as popular confidence in the stability of the Government.

Thus, actual investments in education, training and health are more likely to have a desirable impact in the long run since they bring with them development and an environment in which long-range family-building decisions can be made with greater certainty and hope for the future. The promotion of widespread educational opportunities is a valuable goal in its own right. Although it is well known that fertility varies widely across educational groups, it is not known what the effect on fertility would be if educational differences were sharply narrowed with a massive educational programme. To some extent, fertility differentials by education may reflect underlying distinctions between socio-economic groups, but none the less, widespread education will increase the flow of information and improve women's options which, in the long run, should provide a favourable climate for fertility decline.

CONCLUSION

The last decade has seen dramatic change in many parts of the world with respect to fertility levels and trends. It has also been a period in which much new research has been initiated with major advances taking place in the conceptualization of the components of fertility change and of the methodologies for the evaluation of the impact of family planning programmes. Much has also been learned about actual family formation and fertility behaviour from the unprecedented array of survey research, most importantly the World Fertility Surveys and other fertility surveys, including contraceptive prevalence surveys. Within the context of the basic principles and goals stated in the 1974 Plan of Action, new information and research findings can suggest emerging areas of concern for policy and fruitful new directions for research with respect to fertility and the family. The issues raised in this paper are put forward as an aid to assist in the identification of these emerging areas of policy concern and of fruitful new research directions.

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B. Recent trends and conditions of fertility

United Nations Secretariat*

INTRODUCTION

The United Nations International Conference on Population, 1984 will have as a central task a revision of the World Population Plan of Action in the light of population conditions, trends and policies during the decade 1974 to 1984 and of the requirements of the International Development Strategy for the Third United Nations Development Decade. The World Population Conference, 1974, through the World Population Plan of Action, recommended a number of actions relating to reproduction and family formation which constituted a strategy for enhancing the quality of individual and family life and the condition of women and for fostering humanitarian alternative policies in respect to population growth. This Plan of Action paid special attention to possible linkages between social and economic factors and fertility, noting that certain "development goals generally have an effect on the socio-economic context of reproductive decisions that tends to moderate fertility levels",^{1/} and that countries wishing to affect fertility levels should give priority to implementing "development programmes and educational and health strategies which, while contributing to economic growth and higher standards of living, have a decisive impact upon population trends, including fertility".^{2/}

Taking into account the concerns of the 1984 International Conference on Population, and the "recommendations concerning priority areas for action within the World Population Plan of Action",^{3/} this paper provides an assessment of levels and trends of fertility throughout the world during the decade of the 1970s and shows how certain factors, the modification of which are directly or indirectly specified in the Plan of Action as development goals, were affecting fertility and conditions of the family in this decade. The demographic factors considered include age structure, age at marriage, marital status, types of marital unions and infant and early childhood mortality. The social, economic and other factors include rural-urban residence, level of education, women's work, familial roles and family structure, social development, and health and contraceptive practice.^{4/}

FERTILITY LEVELS AND TRENDS ^{5/}

The 1974 World Population Conference recommended that the monitoring of population trends and policies discussed in the Plan of Action be undertaken periodically. Recent data indicate that the rate at which children are born

* Population Division, Department of International Economic and Social Affairs.

into the world as a whole has continued its decline. During the period 1975-1980, there were estimated to have been in the world as a whole, on the average, 29 live births annually per 1,000 of the mid-year population. During the preceding quinquennium, there occurred annually about 32 live births per 1,000 population. While this change represented a drop of about three births per 1,000 population world-wide, it actually amounted to approximately 14 million fewer births over a period of five years. Undoubtedly, this change in the global picture largely reflected the precipitous downward course that appears to have characterized the crude birth rate of China, which, by the period 1975-1980, had reached an estimated 21 live births annually per 1,000 population.6/

There were marked differences in levels of fertility between developing and developed regions. In the former, births occurred on the average at the rate of about 33 per 1,000 population during 1975-1980, compared with only about 16 in the more developed nations.7/ Levels of the crude birth rate varied even more among individual countries. Although there was a wide gap between the highest and lowest rates recorded in developed countries - a rate of around 21 per 1,000 in Ireland being roughly double the rate for the Federal Republic of Germany (around 10) - the disparity was even more marked among the developing countries. Indeed, the range in levels of birth rates among the latter was almost as great as that for the world as a whole, i.e., from 50 to 54 per 1,000 in some sub-Saharan African countries to about 15 in Cuba.

The variation in levels of crude birth rates within the developing and developed regions reflects the phenomenal changes that have taken place over the past two decades. At the beginning of the 1960s, developed and developing countries were readily distinguished by the level of their birth rates; no developed country recorded a measure in excess of 30 and no developing country had a rate estimated to be that low.8/ Around 1980, according to the best available data, birth rates were higher in 14 developed countries than in Cuba (14.7) and in four of them than in Singapore (17.3).

The most obvious conclusion is that levels of fertility are now considerably less closely related to development than was the case 20 years ago, owing in part to the introduction of national family planning programmes, which appear to have accelerated the fertility decline in many developing countries.

The spread in elective childbearing is but one component of the divergent patterns of reproductive behaviour that are seen in both the developed and developing regions. Fertility is declining in some developing countries, and, due to modernization, is rising in others; counter trends also characterize birth rates in the more developed regions.

Developing countries

Because vital statistics are not registered in most of the developing countries or are of doubtful quality, the course of the birth rate can be documented with firm confidence for only a few countries, and unfortunately, the countries for which data are unreliable include those with the largest populations. From 1970 onward, crude birth rates declined in all but a few of the 27 developing countries with data reasonably adequate to assess trends.

The picture for Asia is dominated by the precipitous decline of fertility in China, which was noted above. Measures for other countries of East Asia are estimated to have decreased, but less impressively, from an average of 30 during 1970-1975 to 27 per 1,000 during the succeeding five years. Over the same period, crude birth rates for South Asia declined from an estimated 40 to 37 per 1,000 with the most modest changes occurring in Western Asia.^{9/}

The average trend in Latin America over the decade under consideration was also downward, although there were some variations: Throughout the 1970s, rates remained relatively constant at around 22 live births annually per 1,000 population in Temperate South America, while in the tropical region, they dropped from 37 to 35 during the two quinquennia and, during the same periods in Central America, they decreased from about 42 to 39. The regional average for the Caribbean masks the fact that in several countries births remained relatively high or stable in recent years while, in one or two, they seemed to have moved upward somewhat.^{10/}

Results of the WFS for a series of countries show that for 5 to 10 years prior to the surveys (taken between 1974 and 1978), a number of Asian and Latin American countries experienced significant decreases in total fertility rates. An intensive evaluative analysis documented declines in 12 of 20 countries that participated in the WFS.^{11/} The decreases from the period 10 to 14 to 5 to 9 years prior to the survey ranged from 5 per cent in Peru and the Philippines to 23 per cent in Costa Rica; in the succeeding period from 5 to 9 to 0 to 4 years before the interviews, the decrease varied from 14 per cent in Malaysia and Peru to 31 per cent in Costa Rica.^{12/} Data for the other eight countries were not adequate to assess trends, or did not indicate a fertility decline. The rather remarkable decreases occurred during the late 1960s and early 1970s and, in some cases, were sharper than had been thought.^{13/}

The crude birth rates for the African regions, with the possible exception of Northern Africa, are estimated to be relatively stable or rising. There is little evidence of downward trends. Measures for the region as a whole are thought to have dropped only from 48 to 46 per 1,000 over a 25-year period. Eastern, Western and Middle Africa have experienced virtually no evident changes.^{14/} The stable rates probably mask strong counter-trends both among sub-populations within these countries and among the different countries. While unchanging levels and modest declines are thought to characterize birth rates in some African countries, others may be experiencing

at least a temporary increase in crude birth rates due to a rise in fertility. Such was the case in several of the Caribbean countries and of those in Central America either during the late 1950s or early 1960s before fertility rates turned downward in the middle to late 1960s.^{15/} Similar evidence exists for states of India ^{16/} and for some other countries of South Asia.^{17/} Certainly, the literature contains many references to such occurrences in some countries of Africa below the Sahara.^{18/} The pervasiveness of this phenomenon of rising fertility in response to development and to the great variety of modernization aspects that have been determined as effecting such change warrant notice. Changes in the incidence and duration of breast-feeding, in traditional abstinence following childbearing, in the prevalence of polygamy, in the quality of health and nutrition, and advances in age at marriage and the consequent decrease in sub-fecundity associated with early marriages are likely to affect higher fertility at least in the short run. Lower adult mortality and a decrease in the prevalence of widowhood among women of reproductive age may also be contributing factors.

The World Population Plan of Action anticipated both that some government goals and policies might conflict with others and also with individual rights, and specified that the latter be given priority consideration. The foregoing discussion corroborates the efficaciousness of that position. Indeed, in nearly all of Africa south of the Sahara, in several countries of Central America and the Caribbean, and in some parts of Asia, especially the Western region, birth rates are estimated to have been relatively high and stable, and if not to have risen, at best to have undergone only a very modest decline in the recent past.^{19/} Circumstances such as those noted above as being likely to cause fertility to rise may in many cases be in conflict with forces and conditions tending to lower fertility, such as family planning programmes, increasing education and employment of women outside the home and changes in family structure.

More developed countries

Around 1980, the range in level of crude birth rates and total fertility rates among developed countries was from 21.5 births per 1,000 population and 3.3 births per woman in Ireland to 10.0 births per 1,000 population and 1.4 births per woman in the Federal Republic of Germany.^{20/} Fertility declined steadily and markedly in the more developed countries from the early to mid-1960s until the end of the 1970s. With few exceptions, this general trend is depicted both by the crude birth rates and by the total fertility rates.^{21/} The principal exceptions are the USSR and countries of Eastern Europe, where (apart from the German Democratic Republic whose crude birth rates followed the course documented for Western European countries) an upswing in crude birth rates and in total fertility rates appears to have commenced in the early 1970s but to have begun to drop or stabilize by the end of the decade.

The picture in respect to present trends is also varied: declining, stable and increasing crude birth rates and fertility rates are found among these countries. The downturn of fertility that began around 1960-1965 persists in Denmark, Japan and Norway, in the southernmost developed countries of Europe and in Oceania. In all other developed countries the downward trend has ceased; further, since the late 1970s, eight European countries and the United States have been experiencing a rise in fertility, as measured by the total fertility rates. Among these countries, the values for the year 1980 were from 2 to 13 per cent higher than the figures at the nadir of the post-1965 trend.^{22/} The result of these changes is that, since 1970 fertility has been, on the average, lower in the developed regions, although the range among those countries in levels of crude birth rates and in total fertility rates has hardly been altered.

SOME FACTORS AFFECTING FERTILITY

The changes noted above in levels and trends of fertility and the apparent lack of change, where this is observed, may be attributed to many of the factors noted in the Plan of Action as requiring national and international efforts at improvement.

The World Population Plan of Action identified approximately 30 steps in the demographic, social and economic spheres as appropriate to ensure choice in matters of reproduction and to enhance the status of the family; not all of these steps can be adequately measured with available data and methodology. Owing to diverse past levels and trends of fertility, as well as of mortality, and to dissimilarities in patterns of nuptiality, there are important distinctions among countries in aspects of population structure that influence crude birth rates and total fertility rates. Further, the countries are at varying levels of development, inhabitants are distributed differently according to rural-urban residence, socio-economic status and level of education, and the quality of life associated with these differences varies among countries. Some cultures encourage early marriage, others tolerate or promote late marriages and the economic activity of females. Some developing countries have viable national family planning programmes; others do not. Among these conditions that influence fertility, the demographic factors will be considered first.

Demographic factors

Since the number of births in a country depends not only on the fertility of women but also on their numbers in the reproductive ages, the trends of the crude birth rate also reflect the changes in the proportion of women in the childbearing ages. In many developing countries where fertility has been high over a long period of time, swelling the proportion of young people and, consequently, lowering the ratio of females of reproductive age to the

remainder of the population, the crude birth rate is relatively low in comparison with fertility as measured by the total fertility rate. But when fertility begins to decline, this is not necessarily reflected by the crude birth rate, since the entrance into childbearing age of the successively larger cohorts of young females born during periods of past high fertility (surviving in ever greater numbers thanks to declining mortality) will tend to "inflate" the birth rate and to mask the fertility decline, just as the entrance of successively smaller cohorts tend to "deflate" the birth rate and to mask a fertility increase.

Because there are still many countries in which the practice of intentional fertility regulation is exceptional rather than commonplace,^{23/} the age at which women marry in these countries is one of the important determinants of their completed family size. As the variance in the level of contraceptive use is enormous among countries, and age at first marriage differs considerably, age at marriage contributes significantly to country differences in crude birth rates and total fertility rates. There is also evidence that other nuptiality characteristics (such as marital status or the type of marital union) as well as another demographic factor - infant and child mortality - may have a sizeable effect on fertility.

Age structure

The populations of the less developed and more developed regions as a whole aged somewhat during the decade of the 1970s.^{24/} In both regions, the number of women in the reproductive ages increased relative to the size of the total population, although the change was more pronounced in the less developed regions than in the more advanced countries. In the latter, the number of women aged 15 to 49 years increased by about 9 per cent during the interval 1970 to 1980, compared with a rise of about 32 per cent in the developing regions.^{25/} Furthermore, the number of females in the peak reproductive ages, 20 to 29 years, relative to all women aged 15 to 49, also increased on the average both in the developed and the developing regions.^{26/} The paucity of reliable data on age precludes a systematic comparison of the extent to which the declines in the average crude birth rates for the developing and developed regions have been influenced by these changes in age composition of the population, and some examples must suffice.

An analysis of the influence of age structure on birth rates in 21 of the developing countries that participated in the WFS ^{27/} disclosed that countries with very high crude birth rates, such as Bangladesh, Kenya, Mexico and Pakistan, also had young populations and that, if the age structure of these countries had been the average of the 21 countries, their birth rates would have been considerably higher. Conversely, for the comparatively older populations of countries in which a fertility decline had been underway for some time, as in Costa Rica or Sri Lanka, the age structure had inflated the crude birth rates. Indeed, the range in birth rates after standardization was from 56.6 per 1,000 population (Kenya) to 25.0 (Sri Lanka) compared with a

variation in crude rates of from 48.7 (Kenya) to 28.3 (Sri Lanka). Thus, the extremes in regional and national levels of birth rates reported in this text are no doubt moderated, among other things, by the differences in age structure among the populations. Moreover, as mentioned above, trends in the birth rates may mask or temper trends depicted by other fertility measures.

Although in many developed countries marital fertility and postponed marriages, among other things, were the factors primarily responsible for the fertility trends during this period; the small cohorts of women born during the Second World War contributed to the recent declines in crude birth rates, just as the larger cohorts born after the War were a factor in the upswing.^{28/}

Thus, trends in crude birth rates, while appropriate indicators of the positive component of population growth trends, are insufficient as a gauge of the course of fertility since they may camouflage the movement of a complex pattern of other factors that should be considered from a policy perspective, just as other fertility measures alone are insufficient as indicators of the positive component of population growth.

Nuptiality

The Plan of Action made a number of recommendations in respect to marriage and the family, which were intended to enhance the quality of family life and to promote improved social, economic and other conditions for individuals.^{29/} The recommendations, if effected, might also have a bearing on fertility.

Age at marriage. Age at marriage influences the lives of women in a variety of ways. In what follows, only the effect upon fertility is considered. The nuptiality data that are available for a majority of the developing countries are of dubious quality and insufficient for an assessment of trends. From the statistics at hand, however, it appears that women enter a marital union earliest in regions of Africa south of the Sahara, and on the Indian sub-continent. At varying dates during the 1970s the singulate mean age of women at marriage ranged from 16.6 to 20.1 in countries of continental sub-Saharan Africa and from 17.5 to 19.6 years in countries of the Indian sub-continent.^{30/} Among developing countries as a whole, the range is estimated at from about 16.6 in Tanzania (1967) to 23.5 in Sri Lanka (1971). This excludes China for which information on age at marriage is not available. It is reported that women are not considered to be of marriageable age until they reach age 23.^{31/}

The WFS obtained statistics on the age at which women first married, or, in some countries where it is especially relevant, the age at which women first entered any kind of sexual union or partnership. Data for 21 countries showed a range in the mean age at marriage for women who first entered into a marital union under the age of 25 as being from 19.4 in the Philippines and

the Republic of Korea to 13.5 in Bangladesh.^{32/} Analyses of the data ^{33/} revealed that, within countries, the completed family size of the individual woman aged 40 and over was inversely related to her age at marriage.

The general finding reflects the connection between age at marriage and the duration of marriage at a woman's given age; the younger her age at marriage, the longer the time she would have spent in a marital union by age 40. However, the relationship between age at first marriage or first union and fertility seems to depend not only on the length of marital duration or on such factors as the incidence of contraceptive use, family size motivation and preferences, birth-spacing traditions and practices etc., but also on the deviations of the age at marriage from the socially accepted norms for marriageable age or on the physiologically optional age for commencing reproductive activities. The analysis of the data from the WFS for example, showed that except in some, mainly Latin American countries, women who entered into their first marital union under age 15 had a slightly smaller completed family size than did those who married at ages 15 to 17. Also, those who married as young as under age 15 had their first child considerably later after the marriage than those who married at a more mature age. This difference in the interval between marriage and first birth may be owing to age-related differences in average fecundability, for there are few among the developing nations for which empirical evidence implies a notable incidence of contraceptive use prior to the first birth.

Yet these data tend not to support the view that early marriage (under 15 or so) leads to serious lasting impairments of fecundity, which would suppress lifetime fertility. On the other hand, raising the minimum age to or establishing it at the range of 15 to 17 years should not be considered a development goal that would tend to moderate the level of fertility. In nine countries that participated in the WFS, the completed family size of women who married at ages 15 to 17 was higher than that of women who married at age 22 and over by more than three children per woman; in 13 countries the difference ranged between 1.2 and 2.9 children per woman. At the same time, women who marry later tend to have higher fertility at the same duration or at the same age than those who marry at a younger age, especially during the earlier years of marriage, but they do not "catch up" as far as lifetime fertility is concerned. As regards the higher duration and age-specific fertility of women who marry later, higher coital frequency early in marriage, age notwithstanding, and a less likelihood of fertility impairment among women who married at a more mature but not too advanced age are plausible explanations. However, in the WFS data, differences among age-at-marriage groups in age-specific fertility tended to be influenced by the national incidence of contraceptive use. Systematic errors in the reporting of live birth intervals may also have influenced the observed patterns.

It is of interest that the effect on fertility of recent increases in age at first marriage estimated for many countries, presumably enhanced by modernizing elements within the societies, do not appear to be strongly associated with levels of development. Using levels of literacy as a proxy for development, correlation coefficients of .04, .03 and .02, respectively,

were obtained for low, middle and high literacy countries when age at first marriage was regressed upon fertility in the five years preceding surveys in 22 countries. A negative association of age at first marriage with number of children ever born was only slightly more evident in the high than in the low literacy countries. (For the categories of countries mentioned above, the coefficients of correlations were, respectively, $-.21$, $-.26$ and $-.26$.)^{34/}

Recommendations in the Plan of Action as to the establishment of an appropriate minimum age at first marriage assumed existence of too low an age at first marriage mainly in certain developing countries. But owing to the changing patterns and timing of entrance into union now occurring in a number of the more developed countries, the concern about age and conditions of marriage expressed in the Plan of Action appears increasingly relevant to these countries as well.

Historically, in the now developed countries, women generally married older than was common until recently, and larger proportions of them remained unmarried. From the turn of this century onward, the first marriage of females occurred at increasingly earlier ages, and fewer and fewer women remained single. A reversal of this secular trend is clearly underway in a number of countries: since the mid-1970s, except in Japan, parts of Southern and Eastern Europe, and a few other developed countries, the age at which most women entered their first marriage first stabilized and then began to advance. However, the change has been occurring slowly, a few months yearly, and, in a minority of cases, the measures of change may not be significant.^{35/}

Along with the rising age at legal marriage in a number of developed countries, there has been a compensating tendency towards early formation of consensual unions. Indeed, whereas in some countries, age at marriage has ceased to decline, age at cohabitation in a formal union has not.^{36/} Though the trend to early entrance into non-legal unions cannot be attributed to it, the spread of acceptable and dependable means of preventing unwanted births may have supported such developments. Indeed, the current advances in the age of women at legal marriage, where it is occurring, is explicable, because consensual unions are becoming more acceptable, unwanted pregnancies generally pose little threat and are tolerated increasingly by societies, and desired family size is small and easily attainable within a few years even in the case of a late marriage. It may be noted that, age at first union therefore does not, on the whole, have an important bearing on fertility in the economically more advanced countries.

Marital status. The distribution of women by marital status influences aggregate fertility levels and patterns. This distribution results from trends in age at marriage and the age-specific incidence of marriage, divorce, separation and widowhood, conditions which, along with levels of remarriage, determine the number of reproductive years that a woman spends within marriage. An intensive analysis of data for 21 developing countries ^{37/} disclosed a moderate correlation ($r=0.6$) between time spent married and the total fertility rate. Divorce, separation and widowhood together accounted for less than 10 per cent of the reproductive span in 9 of 11 Asian countries

and 3 of 8 Latin American countries. If women were not widowed before age 50, total fertility rates would be higher by 1 or 2 per cent in most countries and by as much as 5 per cent in Bangladesh. The main sources of variation in national levels of fertility appear to be the amount of time that a woman is single, i.e., prior to first union, which is on the average greater than time lost to marital disruption. This was evident despite the finding that extra-marital fertility is of importance, especially in African and Latin American countries, and that childbearing is more frequent among formerly married than among single women. It may be noted, however, that among the 21 countries studied, evidence of the distribution of marital status as a determinant of aggregate levels of fertility became less obvious as indications of fertility control increased.

Along with the rise in the proportion of single women in many developed countries, particularly in Western Europe and the United States of America, there has been a sharp upturn in the incidence of divorce.^{38/} In the United States, for example, the rate of annual divorces per 1,000 women aged 14 to 44 years more than doubled, rising from 15 to 37 in the periods 1954-1956 to 1975-1977. In 1970, 5 per cent of females aged 25 to 34 years were divorced; at the end of the decade the comparable figure was 10.5 per cent.^{39/} It has been reported that, in the United States and in some of the European countries, divorce is tending to occur at increasingly shorter duration of marriage, although towards the end of the 1970s a rise in divorce was notable among cohorts in which couples were of middle age or older.^{40/}

Mating patterns. The World Population Plan of Action characterizes the family as the basic unit of society and recommends to Governments a variety of steps calculated to support and strengthen the family as an institution and to enhance the welfare of its members. Recent demographic studies have either confirmed or revealed a wide assortment of conditions and changes in respect to the formation and dissolution of unions (including divorce) that portend the weakening of the family and the alteration of its structure and functions. These have evolved in the now developed countries or were sanctioned by major world religions, societies and laws, and they confirm aspects of the family in many developed and developing countries that may be viewed as undermining many of the goals and principles of the Plan of Action. In the discussion that follows, only implications for fertility are indicated. However, it is readily apparent that the mating patterns have considerable relevance for the status and condition of women and their children, and, because, among other things, educational attainment may be affected by these patterns, particularly in the developing countries, they affect development potential in general.

Both polygamous and monogamous marriages are found in most countries of Africa and the Middle East. Some earlier studies have indicated a higher fertility among women in monogamous than in polygamous marriages, ^{41/} but one analysis of recent surveys in Kenya and Senegal suggests that, in those cultures, polygyny does not depress aggregate fertility and attributes this to the fact that men take a second, frequently very young, wife primarily because the first does not bear children.^{42/}

However, the relationship between fertility and polygyny is a highly complex one. First of all most polygynous marriages begin as monogamous ones, and a polygynous unit may be reduced to a monogamous one. A polygynous woman's fertility may be lower, because of lower coital frequency and a more extended period of nursing than her monogamous counterpart. But aggregate fertility may be higher in some polygynous societies, because polygyny permits the highest proportion of women to be married and exposed to pregnancy.

In many societies, especially in sub-Saharan Africa and in Latin America, childbearing is not confined to "legal unions". The influence of type of marital union (visiting and consensual or common-law unions and legal marriages) on the level of individual fertility has been examined for Guyana and for several countries of the West Indies,^{43/} the relevant statistics were obtained in the WFS. The fertility of women in common-law unions, where couples live together in conditions of varying stability, is generally higher than that of legally married women. Common-law wives are on the average generally younger than married women and thus, as a group, have higher age-specific fertility, but as they become older with large families they tend to legitimate their relationships so that their completed fertility is weighted with that of women who began cohabitation in a legal union, thus inflating the average fertility of the married category of women. Women in visiting unions, i.e., having a more or less steady partner with whom they do not reside, have fewer children than women in legal marriages or consensual unions, both because many are younger than either married or common-law women (a large proportion of women begin sexual congress in a visiting union) and because they experience lower coital frequency. Most of them eventually switch to another type of union. Within each marital union category, the number of children is positively associated with the total number of partners. In summary, among these countries, the woman's completed fertility depends, inter alia, upon the number and types of unions that she experiences, her age while in specific types of union and the number of her partners, which may not be synonymous with the number of unions or union types.

If educational attainment is used as the best available proxy for socio-economic status, it would appear that women in consensual or common-law unions have lower status than have women in other union types. This may be reflected in the greater tendency for educated women who are not married to form a visiting union rather than a consensual union,^{44/} since the former has greater social acceptance.^{45/} The type of marital union also seems to be more closely associated with ethnic group than with rural-urban residence.^{46/} The apparent association of union type with social status and completed family size represents a lifestyle configuration susceptible to policy measures in the interest of family welfare and the improved condition of women.

In many developed countries today, the formation of a more or less stable marital union is no longer necessarily signaled by a legal marriage and, where marriage occurs, it frequently takes place after a period of cohabitation. Moreover, illegitimacy is on the rise both among very young and mature women, cohabiting couples do not feel impelled to legitimate their children, and societies exhibit increasing tolerance for or acceptance of it. Further,

separations and divorces disrupt legal marriages with ever increasing frequency. Given this picture in much of the developed world, it has been observed that the family in these countries is undergoing radical changes,^{47/} and some scholars have questioned the stability of its sociological foundation.^{48/} These trends, weak except in Denmark and Sweden until the late 1960s, were very much in evidence elsewhere in Northern and Western Europe and in the United States in the early 1970s and became more accelerated around the middle of the decade.^{49/} Surveys conducted during the late 1970s in Denmark, France, Sweden and among Swiss citizens in Geneva revealed that very large proportions of couples lived together before marriage. Indeed, a larger percentage of Swedish women aged 20 to 24 years were living in a consensual union than were married, 28.6 and 21.5 per cent, respectively.^{50/} In Iceland, too, the prevalence of consensual marriage, always of important magnitude, was on the rise and 5 per cent of all Norwegian women aged 18 to 45 years and 12 per cent of those aged 20 to 24 were cohabiting without legal sanction.^{51/} In the United States, there were 20 per cent more couples living together without legal marriage in 1970 than in 1960 and 83 per cent more in 1977 than in 1970.^{52/}

The increased tendency for couples to live together while foregoing legal marriage is, of course, complementary to the decline in first marriage rates recorded, not only in the countries mentioned above, but also in countries outside of Eastern Europe, where the pattern is mixed, and in Australia, Canada, Japan and New Zealand.^{53/}

It is not certain how these trends were related to the course of the birth rate during the decade of the 1970s. It is reported that extra-marital fertility increased in Denmark and Sweden, but declined elsewhere in Western Europe, where single women in or outside of unions preferred to remain childless.^{54/} More recently, the rate of births to unmarried women has generally increased in Western Europe and in the United States.^{55/} However, since in most of these countries the course of marital fertility generally paralleled that of the crude birth rates and the total fertility rate, and continued to account for the bulk of births, the impact of the changing attitudes and behaviour with respect to marriage and the family apparently had not played a decisive role either in the nadir achieved by the rates or, where it occurred, in their seeming recovery at the end of the decade.

Infant and child mortality

The Plan of Action calls for the reduction of infant and child mortality as a goal in itself by a variety of means.^{56/} Achievement of this goal might also affect fertility, especially in populations characterized by high rates of both fertility and infant and early childhood mortality. It has been observed that high infant and child mortality influences fertility where couples replace a child who died and where they have large numbers of children in anticipation of such losses, in order to ensure the survival of a certain number, especially of a given sex.^{57/} Where women ordinarily breast-feed

their babies and abstinence is observed concurrently with lactation, as in many high fertility developing countries, especially in sub-Saharan Africa, death of an infant curtails lactation, hastens the advent of risk exposure and shortens birth intervals.

In a relevant study of conditions in Latin America, it was disclosed that couples who experienced child mortality were less likely than others to use contraceptives. The link was not strong, because fertility regulation was not widespread. It was postulated that, as knowledge and the use of contraceptives become more common in the region, direct experience of child mortality might begin to have (a greater) effect on fertility levels.^{58/}

Results of studies carried out by the United Nations suggest that higher infant and child mortality support higher fertility. An analysis of 17 Knowledge-Attitude-Practice (KAP) surveys in 12 countries of Africa, Asia, and Latin America, for example, disclosed that, "... the differences between women who have experienced a child death and those who have not, though relatively small, generally fit the hypothesized pattern of lower levels of contraceptive use among women reporting a child death".^{59/} Another study found that, at certain parities, women with child mortality experience showed substantially less readiness than others to cease childbearing.^{60/}

Thus, from one perspective, that of the child replacement/child insurance hypotheses, declining child mortality should eventually have a depressing effect on fertility. From another, the weakening of traditions that support breast-feeding and post-partum abstinence, which also influence child mortality, should cause fertility to rise, barring a compensating, pervasive spread of effective contraceptive use. On the other hand, it should be noted that high fertility is one of the factors of high infant and early childhood mortality.

SOCIAL, ECONOMIC AND HEALTH FACTORS

In addition to the demographic factors discussed above, the importance of a number of socio-economic factors has been emphasized in the considerable amount of investigative work in differential fertility carried out over the last few decades. The succeeding paragraphs summarize recent findings regarding the influence of social, economic and other factors on fertility levels and changes, in particular focusing on certain topics highlighted in the World Population Plan of Action.

Rural-urban residence

Differences in levels of fertility between rural and urban components of national populations are not stable. It is conceivable that in a homogeneous culture the traditions that regulate fertility are weakened first in urban

areas, while they continue to be observed by the rural population, causing higher urban than rural fertility. However, as the urban people recognize earlier than their rural counterparts the advantages of a smaller family and are influenced by urban facilities and life-style, the fertility of urban inhabitants may drop below that of rural folk. The gap in fertility between urban and rural residence may increase for a time but subsequently narrow or disappear as rural and urban life become increasingly similar.

Recent findings generally point to higher fertility in rural than in urban places, although there are cases in both developing and developed regions in which little or no difference in fertility between rural and urban residents can be observed or in which the fertility of urban dwellers is higher than that of their rural counterparts. Not surprisingly, urban fertility is higher than rural in several developing countries. For instance, the latest estimates for Liberia show an urban general fertility rate of 218 live births per 1,000 women aged 15 to 49 years, about 10 per cent above the corresponding rural rate.^{61/} Average cumulative fertility in three Asian countries, Indonesia, Nepal and Pakistan, is also higher in urban than in rural centres according to results of WFS surveys.^{62/}

However, analysis of WFS data for 20 developing countries documents the generally negative influence of urban living on fertility after the effects of such factors as age of women at marriage, marital duration and education of mothers have been eliminated. As far as the "net" fertility differences are concerned, rural fertility is consistently higher in all countries (except Indonesia), even though the difference is not always significant.^{63/} The data from Indonesia display a contrary pattern, while in Bangladesh and Pakistan no significant rural-urban differentials in fertility emerge. If the levels of literacy is used as the measure of development, a fairly clear progression is evident: among the least developed countries in this group, urban fertility is only 6 per cent less than rural fertility on the average, while among the more developed countries the difference grows to 29 per cent.

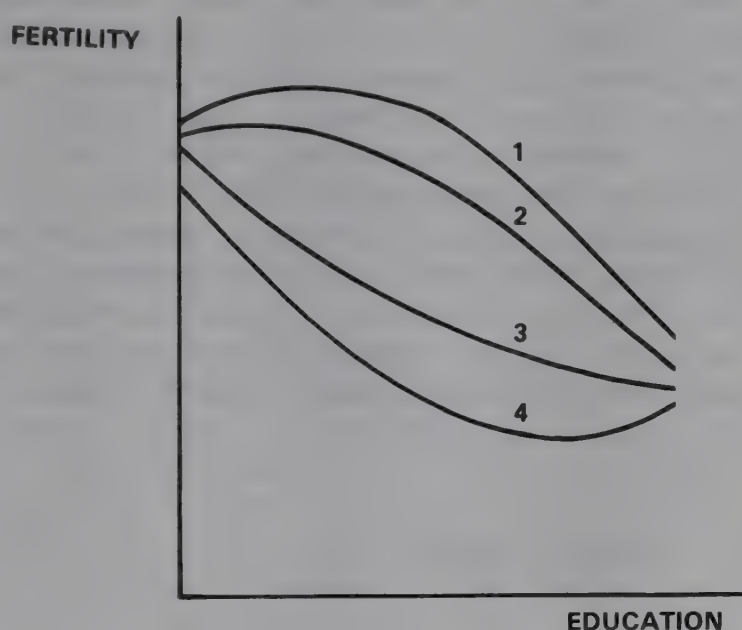
Use of a threefold residence classification - rural, minor urban and major urban - reinforces this pattern. The minor urban-major urban differential accounts for almost the entire rural-urban difference in fertility among low-literacy developing countries; among high-literacy developing countries, however, about two thirds of the total gap in fertility corresponds to the rural-minor urban differential. Thus, fertility reduction may be associated either with towns or with metropolitan cities: current evidence suggests that the spread of industrialization to urban concentrations is more important than the size of the concentrations themselves. It may also be pointed out that this finding links a recommendation of the Plan of Action concerning the strengthening of "... small and medium-size cities ..."^{64/} to other recommendations in the same document regarding measures to lower the level of fertility.

Recent findings from a number of WFS surveys carried out in developed countries show that the level of fertility in rural areas has remained somewhat above urban levels (see part Two, II,C). In terms of children ever

born, the difference amounts to less than half a child in Poland and between a quarter and a half in Finland, France, Norway and Yugoslavia. Insignificant differences were observed in Belgium, Italy, the Netherlands and Spain.

Level of education

The educational attainment of parents has consistently been shown to be an important factor in explaining variations in levels of fertility. The relationship generally noted, in surveys covering all regions of the world, has been a negative one in that groups with high educational attainment (of either husband or wife) have lower fertility than low-education groups. Within this overall tendency, however, many variations and even counter trends have been recorded. The main types of the education-fertility relationship which has emerged as a result of recent comparative studies 65/ can best be illustrated graphically:



where the four lines represent the relationship at four stages of development (from 1 = least developed to 4 = most developed).

An important question raised by comparative analysis of the education-fertility relationship concerns the causal mechanism behind the observed differentials. On the one hand, it is often assumed that the education-process itself, involving the possibility of psychosocial changes in values and outlook, is responsible for fertility decline. Some evidence, however, suggests that educational attainment is largely an indicator of other attributes such as socio-economic status. In developed countries for instance, where a U-shaped pattern between education and fertility is often found, the positive relationship at the upper end of the educational spectrum is frequently interpreted as an income effect, not due to education per se.

Results from a comparative study of recent WFS data for 22 developing countries has shown that the various patterns illustrated above do indeed succinctly summarize the education-fertility relationship found.66/ Countries

at a low level of literacy and per capita income such as Bangladesh, Indonesia, Kenya and Nepal show either increasing fertility with education or slight overall declines and a hump-shaped pattern. On the average, women with 10 and more years of schooling had had only 0.56 children less than women with no schooling in these countries.^{67/} On the other hand, Costa Rica, Guyana, Jamaica and Panama, four high-literacy countries, demonstrate monotonic negative patterns of fertility by educational level and large differentials (on average, 1.76 children less for women with 10 and more years of schooling).

Similarly, desired family size is also generally negatively related to educational level in the 22 developing countries studied. The relationship, however, tends to be monotonic and no change by level of development is apparent. Overall, women in the highest educational category desired about one child less than did completely uneducated women.^{68/}

Recent analysis of WFS data for 13 developed countries revealed three patterns of relationship between education and fertility.^{69/} (See part Two, II, C). The first pattern, a generally inverse relationship, was found in Czechoslovakia, the Netherlands, Norway, Poland, the United States and Yugoslavia. On the average, in terms of achieved fertility, there was a differential of about 0.18 children between educational groups. The second education-fertility pattern, including Finland, France, Great Britain, Hungary and Italy, was U-shaped or at least L-shaped, but the average inter-category differences were about the same (0.17 children). Finally, Belgium and Spain, the two remaining countries included in the study, displayed no clear pattern between education and achieved fertility (average inter-category difference: 0.10 children).

Women's work

The World Population Plan of Action gives great importance to enabling women to participate in development through gainful employment. Participation by women in the labour force is hypothesized to have a negative influence on fertility in all regions of the world, regardless of level of development, with a principal condition for the relationship being a change in location of work from within or near the household to distant locales, or working conditions otherwise unsuitable for child-rearing. Another factor conditioning the impact of women's work on fertility is the presence of older children, grandparents or other persons in the household or generally available help in the rearing of children once they are no longer physically dependent on the mother.^{70/} This, of course, is more relevant in developing societies where fertility is at a high level and where customs make such help possible.

In light of the above, it may be hypothesized that the strength of the women's work-fertility relationship ought to increase as socio-economic development proceeds. Results of a recent study ^{71/} confirm this expectation. In almost all of 20 developing countries in which WFS surveys

were conducted, statistically significant and often substantial relationships were found between current fertility and women's work, even after controlling several other socio-economic factors. Women employed outside the household had the lowest fertility, family-employed or self-employed women had intermediate levels, and women who had never worked generally had the highest current fertility. The causative direction of the association, however, remains unclear since a similar analysis focusing on contraceptive use found little evidence of a significant relationship with woman's work.^{72/}

Another study concentrating on women's work in 10 developing countries, again using WFS data, found significant differences in the mean number of children ever born to women by different measures of women's work.^{73/} In particular, women in non-agricultural industries, working away from home and/or in non-family employment in general have lower cumulative fertility than women in the converse categories or than non-working women. This is especially evident in the three Latin American countries studied (Colombia, Panama and Peru) where, for example, the average number of children ever born to women working away from home, working at home and not working were 3.73, 4.21 and 4.33 children, respectively. Bangladesh and Indonesia, on the other hand, did not follow this pattern. In some other countries, the fertility of housewives lay between that of women engaged in agricultural work at home and those employed in non-agricultural occupations away from home. The possibility cannot be ruled out that these divergent patterns reflect differences of work concepts across countries.

In contrast to the somewhat ambiguous results noted above, in developed countries, women's work is strongly associated with lower fertility. Analysis of WFS data showed differences in cumulative fertility between currently working women and women who had not worked since marriage, even after controlling several other factors, of between 0.6 and 0.8 children in Belgium, France, Great Britain, Hungary, the Netherlands and the United States (see part Two, II, C). On the other hand, in Italy, Poland, Spain and Yugoslavia, only moderate differences were found in fertility according to women's work history. There appears to be some evidence that women's work and childbearing tend to be relatively less compatible activities in economically highly developed countries.

Familial roles

The World Population Plan of Action stresses the importance of the family as the essential medium in which individuals attain well-being, and it specifies that the roles of individuals within the family should be compatible with the full realization of individual rights and their social, cultural, political and economic potential.

The full integration of women into the development process, health and educational opportunities for children, the health and well-being of the aged, all can be impeded by roles and responsibilities imposed by the family if these roles and duties are not compatible with the internationally recognized human rights of individual freedom and justice.

The theory has been advanced that traditional family structures and the concomitant roles played by individual family members have a positive effect on fertility, since children contribute net benefits to the family; young offspring working in household enterprises (and remittances from non-resident sons) and the old-age security provided to parents later on by adult children make high fertility preferable for individual parents. Others have extended this theory to family structure,^{74/} claiming that joint and polygynous families with widespread kinship obligations (common in many of the less developed regions of the world) are supportive of high fertility, while nuclear families, lacking the possibilities for children to play these economically beneficial roles, tend towards low fertility. While it is true that joint family systems are prevalent only in less developed regions where the level of fertility is high, the few data available on this subject do not, in general, confirm a link between family structure and fertility. ^{75/} Cross-sectional surveys demonstrate a lower fertility among women living in joint households, but also show that women in joint families are often younger than their nuclear-family counterparts, and if age is controlled, differences in cumulative fertility by family type tend to disappear.

The view that joint households based on polygynous relations would tend to encourage high fertility is not supported by recently available WFS data. Analysis of such data ^{76/} from two African countries (Kenya and Senegal) where polygyny is prevalent shows, for example, that wives aged 35-44 had borne, on the average, 6.4 to 6.5 children whether their husbands had one, two, three or more wives.

As noted earlier, the World Population Plan of Action offers a number of recommendations aimed to protect the family including the strengthening of family ties and the promotion of respect within the family. These aims, desirable in themselves, can if attained, also influence fertility. The extent of husband-wife communication may be taken as a proxy for the wife's status within the family (which in many countries is not such as to command respect), the rationale being that the more nearly equal in status the wife is with the husband, the more likely it is that decisions affecting reproduction and other aspects of family life will be made jointly by the spouses rather than by the husband alone. Results of field studies carried out in four Asian countries led to the conclusion that communication between husband and wife was mediated by the freedom of the wife, level of family income, family size and, particularly, the respective levels of the spouses' educational attainment.^{77/} Thus, communication did not of itself influence fertility. However, research conducted in another region revealed that failure of the husbands and wives to communicate might have explained their failure to adopt family planning.^{78/} It has also been reported that "... in their early stages, family planning programmes advocated methods removed from coitus, which tended to minimize [the need for] changes in relationships between husbands and wives",^{79/} that in developing societies women are less likely than their husbands to favour high fertility,^{80/} and that "a greater role in female fertility decision-making would itself imply an important transition in the superstructure".^{81/} Such reports argue robustly for the enhancement of the wife's role in decisions on family matters and emphasize the efficaciousness of the relevant recommendations in the Plan of Action.

Social development

The World Population Plan of Action identifies a specific group of developmental goals relating to social development that generally have an effect on the socio-economic context of fertility. These goals include the "promotion of social justice, social mobility, and social development particularly by means of a wide participation of the population in development and a more equitable distribution of income, land, social services and amenities".^{82/} Of these concerns, the effect of urban-rural disparity on the distribution of social services and amenities and of the wider participation of females in the work force were discussed in previous sections. As for the other developmental goals mentioned, some information is provided below on the effects of social mobility and income inequality on fertility.

Research undertaken in the early 1950s permitted the conclusion that social mobility can, if it is upward, depress fertility.^{83/} Two more recent studies of these relationships in some developed countries have yielded contradictory findings: one claiming strong interrelations between fertility and social mobility,^{84/} and the other finding no relationship.^{85/} However, social mobility may influence fertility indirectly in developing countries through the effect on infant and early childhood mortality and the differential in propensity toward breast-feeding, lengthy post-partum abstinence, the employment of women outside of the home and so on, between upwardly mobile and non-mobile individuals.

Earlier studies of differential fertility according to income and the size of landholding revealed sizeable fertility differences among income and landholding categories.^{86/} Thus, the theory is plausible that changes in income and land distribution affect fertility. However, these studies also showed that the differentials were not uniform in space and time, that they underwent substantial changes, and that they also depended on other variables (for example, the association between fertility and income differed at various levels or between fertility and landholding among religious groups).

In the developed countries, census returns usually demonstrate considerable differences in marital fertility between landless farm workers and farmers at the same duration of marriage or at age of women.^{87/} According to observations made at different times in a number of countries, wives of agricultural farm workers had more live births (e.g. France, 1911, 1946; Great Britain, 1946; England and Wales, 1961; Irish catholics, 1961) in contrast with other findings that showed more children in the farmer families (e.g. Hungary, 1930, 1949; the Netherlands, 1960; Czechoslovakia, 1961; Irish non-catholics, 1961; German Federal Republic, 1962). It should be considered, too, that the cumulative fertility of the landholding group also reflected the fertility of agricultural worker families that later obtained land. Thus, while the family size of agricultural workers was smaller in Hungary than that of the farmers, the general fertility rate of the former surpassed that of the latter at each census between 1900 and 1960. ^{88/} The differentials also

changed in time; in Norway, for instance, the families of agricultural workers had more children after 18 years of marriage than that of the farmers in 1920 and 1930, but less in 1950.^{89/}

Apart from the above, few observations are available on fertility differences by the size of landholding. A study of 20 Polish villages in 1948 concluded that the larger the landholding, the greater the family size.^{90/} On the other hand, an analysis of the fertility of the Hungarian agricultural population by landholding showed that the standardized number of children ever born increased from the landless group to the group of small-to-medium-size landholders (5.7-14.4 hectares) but decreased for landholders above this category.^{91/} Interestingly, somewhat similar findings were reported from a Bangladesh survey, where the size of the household increased sharply from the landless households to those who owned about three acres of land, but above this size the increase in the household was much slower and did not keep pace with the increase in landholding.^{92/} There were also earlier reports of a positive relationship between rural family size and economic status in some developing countries.^{93/}

Findings in respect to differentials in fertility by income, as mentioned earlier, are seemingly as inconclusive as the differentials by landholding. Obviously, the observations do not support unanimously the theory that income and land equality are associated with low fertility. Yet some cross-sectional multivariate statistical analyses ^{94/} of data from several countries seem to suggest that declining inequality, while increasing fertility in the short run, may depress it later in less developed countries. A recent study also concluded that factors reflecting economic inequality were more important in explaining provincial variations in fertility than some other factors used in the equations.^{95/} However, the effects of these factors on fertility do not appear to be very strong and, as is well known, cross-sectional studies are not suitable bases for inference with any statistical probability as to the future trend in fertility provided there is a given change in one of the variables (e.g., economic inequality).

Health factors

Although not well studied in demographic terms, many health factors have been linked to lowering fecundability, either temporarily or permanently.^{96/} Because several problems make research into the demographic consequences of such factors inherently difficult, no precise answers are available as to either the extent to which health factors depress current fertility levels or the probable effect of removing these medically-related causes of sub-fecundity and infertility. It is, nevertheless, evident that the call at the 1974 World Population Conference for the "elimination of involuntary sterility and sub-fecundity in order, that all couples may be permitted to achieve their desired number of children",^{97/} is relevant in developing and developed regions alike.

Given the widely cited estimate of maximum population fecundity of about 15 children per woman, the fact that in most developing countries, fertility under "natural" conditions rarely exceeds six to eight births per woman has led many researchers to believe that, in addition to customs that regulate fertility and "natural" child-spacing practices, physiological sub-fecundity may also be an important, if little documented, part of the explanation of this large gap. Disease and malnutrition are among the principal causes cited as reducing fecundity (the latter has recently been questioned 98/), but certain psychopathological factors, including psychoses, drug abuse (alcoholism, cigarette smoking, inter alia) and psychic stress, may be particularly relevant in societies undergoing rapid transition, modernization and urbanization.99/ Diseases likely to depress fecundity and hence fertility include gonorrhea, tuberculosis, smallpox, malaria, sleeping sickness, filariasis, Chagas' disease, syphilis, German measles, toxoplasmosis, anaemia (often associated with malaria) and genital infections, especially those resulting from female circumcision, abortion and childbirth.100/ Although the effect on fertility is unknown, these diseases, taken together, claim hundreds of millions of victims, malaria alone infecting an estimated 600 million persons.

Malnourishment probably also contributes to reducing fertility in several developing countries. Different causal paths have been identified: by the direct impairment of genitalia, by lactational changes and by infant mortality (the latter being a contrary effect). Although starvation and famine produce well-documented temporary declines in fertility, the more general condition prevailing in some regions is one of chronic malnutrition. Most experts now agree, however, that the direct biological effect of nutrition on fertility is minor.101/ A shorter reproductive time-span also has been convincingly related to poor nutrition, but since this involves the beginning and end of the reproductive period, the reduction of total fertility is probably insignificant. A perhaps more serious, but inadequately studied complication of chronic malnutrition is the development of a contracted pelvis which complicates parturition, increasing the chance of subsequent infection.102/ Adolescent sub-fecundity and health complications at pregnancy and childbearing occurs where girls are exposed too early to pregnancy risk.103/

In the more advanced countries, health-related sub-fecundity is a less important determinant of fertility levels, partially because fertility desires are already so low. A number of trends suggest, however, that sub-fecundity may become an increasingly important factor in achieving even these low targets. Psychopathological causes and disease, especially gonorrhea, genital herpes and other infectious genital diseases may be increasing the level of sub-fecundity. Health impairments linked to the use of intrauterine devices (IUD) and abortion may also become more prevalent in developed countries, given existing trends in contraception and abortion. The threat from a polluted environment may also be mentioned as a possible source of increasing sub-fecundity; the deleterious effects of radiation, certain pesticides and other toxic chemicals have already been documented.

Contraceptive use

The World Population Plan of Action has as one of its principles that "all couples and individuals have the basic right to decide freely and responsibly the number and spacing of their children and to have the information, education and means to do so".^{104/} The vast majority of countries directly support access of their inhabitants to modern means of fertility regulation. As of July 1980, this was the case with 81 out of 126 developing countries and with 25 developed countries, with the numbers giving indirect support being 14 and 8 respectively.^{105/}

A striking feature of world-wide contraceptive practice is that, although the use varies in proportion to the level of national development, there exists a substantial similarity between regions in the "mix" of contraceptive methods used. That is, the spread of the so-called modern methods of contraception (principally sterilization, pills and IUD) has taken place almost at the same time in developing countries as it has in developed countries, i.e., during the last two to three decades. Much variation in the relative prevalence of particular methods is observed, but this seems to be related more to differences in culture and historical experience among countries than to regional or developmental differences.

A recent study of current contraceptive use ^{106/} covering 20 developing countries for which WFS data were available found that it varied widely, from 64 per cent of currently married women in the reproductive ages in Costa Rica to as little as 2 per cent in Nepal. Regionally, Latin American countries reported the highest range of current contraceptive use (30 to 64 per cent of currently married women); Asian and Oceanic countries fell into the range of 2 to 40 per cent; and three African countries (Kenya, Lesotho and Senegal) reported levels of current use of from 4 to 10 per cent. Trends in contraceptive use are more difficult to gauge because of methodological differences between surveys, but during the first half of the decade of the 1970s there appeared to have been large increases in the percentage using contraception in Colombia, Costa Rica, Indonesia, Malaysia, Mexico, the Philippines, the Republic of Korea and Thailand. In Jordan, Pakistan and Peru, on the other hand, little change was reported.

As noted above, modern methods are now widely applied by users of contraceptives in developing countries. In the study of 20 developing countries, only in Peru and the Philippines were modern methods used by less than 50 per cent of all users. In general, oral contraceptives were the most frequently used, and sterilization had also become widely spread in several countries.

Contraceptive use differs according to socio-economic factors in patterns similar to those noted for fertility, discussed above. A recent comparative analysis of ever-use of contraception in 22 developing countries, however, showed that the strength of effort of national family planning programmes explained much of the variation in the relationship between ever-use and

educational level.^{107/} While a higher developmental level tends to enhance the positive association of education and contraceptive use, family planning programme effort significantly diminishes it. Thus, there is some evidence that contraceptive use, given a strong family planning programme, may transcend socio-economic barriers.

Reports covering developed countries ^{108/} showed that, around 1975-1977, in eight countries out of nine for which WFS data were available, 75 to 89 per cent of the married women of reproductive age used contraception or were sterilized, sub-fecund or infecund; in one country (Spain), the percentage was only 50. The United States (28 per cent), Denmark and Great Britain (19 per cent each) had the highest proportions of married women of childbearing age who were sterilized while, in other European countries, particularly in Hungary, the Netherlands and Spain, contraceptive sterilization was virtually non-existent.

Changes in contraceptive use during the 10 years prior to the WFS round of surveys were highlighted by replacements of one method by another, although overall level of use also crept upwards. The trend of changes in contraceptive practices moved from the traditional folk methods (of mainly withdrawal and periodic abstinence or rhythm) first towards the so-called "drugstore" methods (such as diaphragm, spermicides and, first of all, condom) and later to the "modern" contraceptives (i.e., pill and IUD) and sterilization. These changes explain the main patterns of current contraceptive use in developing countries. In one group of developed countries, folk methods still prevail, but the condom (Poland ^{109/}) or the pill (Spain and also Poland) has gained in popularity. In others (Belgium, France and Hungary), the use of folk methods persists but at a lower level than in the first group: the drugstore methods were never popular or lost their attractiveness and, recently the use of modern methods, primarily oral contraceptives, has registered a dramatic increase. In the third group, the use of folk methods has lost significance, and modern methods have become dominant (first of all the pill, as in the Netherlands), but in many countries the use of the drugstore methods (mainly that of the condom) is still popular, as in the United Kingdom of Great Britain and Northern Ireland and Norway (where, as an exception, the use of the IUD is more widespread than that of the pill); in some, sterilization has attained growing importance (Denmark, United Kingdom, United States).

Clearly, information about contraceptive use cannot provide the full picture of birth regulation. The patterns of contraceptive use can only be evaluated in the light of abortion conditions for which reliable information is relatively meager even where abortion is legal. For some countries, an accounting of the incidence and conditions of sterilization would be among the requisite information for a proper assessment of birth regulation.

Notes and references

1/ United Nations, Report on the United Nations World Population Conference, 1974 (United Nations publication, Sales No. E.75.XIII.3), p. 12.

2/ Ibid.

3/ Economic and Social Council resolution 1979/32; Review and Appraisal of the World Population Plan of Action (United Nations publication, Sales No. E.79.XIII.7), pp. 58-59.

4/ Although other sources are also utilized, this text is based essentially upon reports prepared by the Population Division of the United Nations, the regional economic commissions, ILO and WHO, as members of the United Nations Working Group on Comparative Analysis of World Fertility Survey Data. The Working Group's project is an effort to carry out research on 17 items of a Minimum Research Plan extracted from George T. Acsádi: "Research plan for comparative analysis of WFS data of the Population Division of the United Nations" in The United Nations Programme for Comparative Analysis of World Fertility Survey Data (New York, United Nations Fund for Population Activities, 1980), pp. 3-26.

5/ Based on United Nations, World Population Prospects as Assessed in 1980 (United Nations publication, Sales No. E.81.XIII.8), table A-6; United Nations, World Population Trends and Policies, 1981 Monitoring Report, vol. I, Population Trends (United Nations publication, Sales No. E.82.XIII.2); United Nations, World Population Trends and Policies, 1983 Monitoring Report (in preparation).

6/ Ibid. A figure of 18.3 has been quoted for the year 1978. See also Chen Muhua, "Birth planning in China", International Family Planning Perspectives, vol. 5, No. 3 (New York, September 1979), p. 92.

7/ World Population Prospects as Assessed in 1980 (United Nations publication, Sales No. E.81.XIII.8), table A-6.

8/ Population Bulletin for the United Nations - 1963 (United Nations publication, Sales No. 64.XIII.2).

9/ United Nations, World Population Prospects ..., table A-6.

10/ Ibid.

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12/ Ibid. The countries examined that have World Fertility Survey data adequate to assess trends are Colombia, Costa Rica, Fiji, Guyana, Jamaica, Malaysia, Mexico, Panama, Peru, Philippines, Republic of Korea, Sri Lanka and Thailand.

13/ The crude birth rate trends described in the preceding paragraphs for these two regions do not relate to the same period. However, they suggest most modest decreases. The differences may reflect the timing, the quality of the data or the influence of structural changes on the crude birth rates.

14/ World Population Prospects ..., table A-6.

15/ Rising birth rates attributable to higher fertility have been estimated, among other countries, for Kenya, Niger and Senegal. Ibid.; see also, World Population Trends and Policies, 1977 Monitoring Report, vol. I, Population Trends (United Nations publication, Sales No. E.78.XIII.3), pp. 62-64.

16/ K. Srinivasan, P.H. Reddy and K.N.M. Raju, "From one generation to the next: changes in fertility, family size preference, and family planning in an Indian state between 1951 and 1975", Studies in Family Planning, vol. 9, Nos. 10-11 (October-November 1978); K. Srinivasan and Shireen Jejeeboy, "Changes in natural fertility in India, 1959-1972", paper presented to the IUSSP Seminar on Determinants of Fertility Trends: Major Theories and New Directions for Research, Bad Homburg, 14-17 April, 1980.

17/ 1977 Monitoring Report, vol. I.

18/ See, for example, J. Bongaarts, "The fertility impact of traditional and changing childspacing practices in Tropical Africa", Working Papers No. 42, Center for Population Studies, The Population Council (New York); G.T. Acsádi, "Traditional birth control methods in Yorubaland", in Culture, Natality and Family Planning, J. F. Marshall and S. Polgar, eds. (Chapel Hill, North Carolina, United States, 1976), pp. 126-155.

19/ 1977 Monitoring Report, vol. I, pp. 62-64; World Population Prospects ..., table A-6.

20/ Excluding Albania, Cyprus, Israel and Turkey, which are sometimes included with developed countries. Council of Europe, Recent Demographic Development in the Member States of the Council of Europe, Strasbourg, 1981; 1983 Monitoring Report; United Nations Demographic Yearbook 1980 (United Nations publication E/F.81.XIII.1).

21/ Levels and Trends of Fertility Throughout the World, 1950-1970, (United Nations publication, Sales No. E.77.XIII.2), chap. VI; 1983 Monitoring Report; Council of Europe, Recent Demographic Developments in the Member States of the Council of Europe, op. cit.

22/ Council of Europe, op. cit., pp. 5-8; G. Calot and C. Blayo, "Recent course of fertility in Non-Communist European countries", paper presented to the Conference on Recent Developments in the Population of Europe, University of Exeter, 16-18 September 1981. Table 16; 1983 Monitoring Report (in press).

23/ See, for example, "Variations in the incidence of knowledge and use of contraception: A comparative analysis of World Fertility Survey results for twenty developing countries" (ST/ESA/SER.R/40).

24/ 1981 Monitoring Report, vol. I, chap. 5. World Population Trends and Policies, 1981 Monitoring Report, vol. I (United Nations publication, Sales No. E.82.XIII.2), chap. 5.

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26/ Ibid. For the more developed countries, the percentages are 28.9 and 32.1 for 1970 and 1980, respectively, and 32.9 and 36.0 for the less developed group.

27/ United Nations, Population Division, "The impact of population structure on crude fertility measures: a comparative analysis of World Fertility Survey results for twenty-one developing countries" (IESA/P/ICP.1984/EG.I/22).

28/ Levels and Trends of Fertility Throughout the World, 1950-1970 (United Nations publication, Sales No. E.77.XIII.2), pp. 229-230; United Nations, 1981 Monitoring Report, chap. 3.

29/ Report of the United Nations World Population Conference, 1974.

30/ United Nations, World Population Trends and Policies: 1981 Monitoring Report (United Nations publication, Sales No. E.82.XIII.2), chap. 3; Economic Commission for Africa, "Marriage and fertility in Africa" (IESA/P/ICP.1984/EG.I/7). Singulate mean age at marriage is calculated from the proportion of women enumerated as single at different ages in a population census or survey.

31/ 1981 Monitoring Report.

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34/ United Nations, Relationships Between Fertility and Education: A Comparative Analysis of World Fertility Survey Data for Twenty-Two Developing Countries (ST/ESA/SER.R/48).

35/ 1981 Monitoring Report.

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53/ 1981 Monitoring Report, chap. 3.

54/ Festy, "On the new context of marriage ...", loc. cit., p. 314.

55/ Festy, "Marrying, divorcing and living together in the United States today" op. cit.

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57/ For a thorough treatment of this topic, see S.H. Preston, ed., The Effects of Infant and Child Mortality on Fertility (New York, 1978). Note especially the introductory chapter by S.H. Preston.

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62/ Economic and Social Commission for Asia and the Pacific "Differentials in urban-rural fertility in the countries of the ESCAP region", paper presented to the United Nations Working Group on Comparative Analysis of World Fertility Survey Data, Fifth Meeting, Geneva, 26-29 January 1982, p. 8. In discussing rural-urban differential fertility, a distinction must be made between the "crude" or real fertility differential and the effect of rural and urban residence, i.e., the "net" fertility difference that would be observed if the characteristics of the urban and rural populations were the same. "Crude" rural-urban differentials, while of little use in examining the effect of residential patterns upon fertility, nevertheless indicate overall differences in reproductive performance between rural and urban sub-populations.

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66/ Relationships Between Fertility and Education ...; with the exception of the fourth pattern which represents developed countries.

67/ With demographic factors standardized as well as rural urban residence.

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C. New currents and emerging emphasis in research and policy

Hilary J. Page*

INTRODUCTION

The task assigned the Expert Group Meeting on Fertility and Family was to identify those areas in current scientific knowledge and concerns regarding fertility and family that were of greatest salience for policy formulation and implementation; particular attention was to be paid to shifts that had occurred since the 1974 World Population Conference in Bucharest. The task was a challenging one because the last decade has been one of unprecedented changes in terms of social and economic transformation and one of not inconsiderable advance in our grasp and perception of them: this was very evident in the richness and complexity of some of the papers prepared for the Expert Group. This overview does not seek to provide a comprehensive summary of the work of the Group - the text of the Report does that; rather it attempts to highlight some major issues and currents that ran through the meeting, whether explicitly or implicitly, drawing not only on the papers but also on the unusually rich discussions.

Although the main focus of the Expert Group work was, quite naturally, on the problems of the developing countries, discussion cannot be restricted entirely to them. The problems currently being faced by developed countries not only warrant some consideration in their own right, but they may well be able to serve as a kind of early warning system and testing ground with respect to some of the problems that developing countries may also face when their fertility reaches low levels.

The overview is organized around three main themes: (a) advances in our knowledge of fertility levels and trends; (b) advances in understanding the relationships between development, fertility and the family; (c) theoretical advances and practical experience with respect to policy formulation and implementation.

First, however, it is necessary to review briefly the most salient changes in the situational context that have occurred since Bucharest.

THE SITUATIONAL CONTEXT: SHIFTS SINCE BUCHAREST

The 1984 International Conference on Population in Mexico City and four expert group meetings preparatory to it are embedded in a situational context that is quite different from that which surrounded Bucharest and its preparatory symposia. This is particularly striking with respect to fertility and family.

*Interuniversity Programme in Demography, Brussels.

First, the world demographic situation and trends have changed in ways that, although not necessarily dramatic, are very significant. At the same time, awareness of local and global patterns has increased quite markedly. Among developing countries, the beginnings of fertility decline, though far from being universal, are no longer confined to a few "exceptional" countries: fertility decline is now becoming discernible in an increasing number of countries. This does not mean of course that absolute population increase is also starting to decline: on the contrary, because of a youthful age structure (inherited from high fertility in the past and intensified in most cases by recent declines in mortality), absolute increases in most countries are higher than ever before and likely to remain high for several decades, or even to increase.

Secondly, both recognition that existing fertility patterns may act as a brake on development and the acceptance that fertility is a legitimate area for governmental policies and programmes are much more widespread. There may be some minor skirmishes over these fundamental issues at the Mexico Conference, but the battle of Bucharest is now essentially part of social history. The main thrust of the debate now is likely to be directed at defining the most desirable goals and at considering the legitimacy and desirability of particular types of intervention.

It is important to note that these two sets of changes have not been restricted to developing countries: parallel changes have occurred elsewhere. For decades most of the currently developed countries were able to coast on fertility trends which, for one reason or another, did not have serious adverse consequences for their development and which, in addition, took place with relatively little explicit and direct governmental intervention. During the 1960s and early 1970s - the run-up period to Bucharest - only a handful of these countries were deeply concerned about the possible implications of very low fertility for their further development. These are no longer exceptional. An increasing number of developed countries have now approached or even gone below replacement-level fertility - a threshold that is largely symbolic but one that does draw public attention rather effectively to the presence of very low fertility and to its implications (especially its long-term implications for the age structure) - and have been considering forms of intervention that might stem or reverse their fertility decline.

Finally, the Mexico City Conference will meet in a period of deeper world economic crisis than the Bucharest Conference and concerns with, for example, unemployment are likely to be paramount.

ADVANCES IN OUR KNOWLEDGE OF FERTILITY LEVELS AND TRENDS

Our knowledge of existing patterns and their composition has increased markedly over the last decade, largely as a result of the exploitation:

- (a) Of more data (virtually world-wide census coverage, plus large-scale survey efforts like the WFS, and better estimation techniques for measuring overall fertility levels and trends;
- (b) Of new approaches to studying the reproductive process and family formation.

In the latter category the most significant advances have resulted from the increasing attention paid, on the one hand, to the different ways in which fertility was held below its biological potential in traditional societies and, on the other hand, to the development of analytical models and decompositions (most notably that due to Bongaarts) with relatively simple data requirements that permitted quantification of the role of the various proximate determinants of fertility (in particular, the patterns of entry into union and of union dissolution, use of contraception and its effectiveness, resort to abortion, and length of the post-partum, non-susceptible period during which the woman, by virtue of anovulation and/or abstinence, cannot conceive again.

The combination of new methods and data has made systematic examination possible for the first time for several of the proximate determinants, and has considerably improved the state of our knowledge of those for which some information already existed. It has also permitted evaluation of the potential contribution of changes in each to fertility trends. Widespread appreciation of the major role played by traditional practices that restricted fertility (such as prolonged breastfeeding or abstinence) is quite new.

One of the most far-reaching offshoots has been the spreading and deepening realization that the various proximate determinants of fertility can vary independently; that they may all respond to the same set of factors but that their responses may exhibit different elasticities, and may even be in opposite directions. In particular, not all the proximate determinants necessarily shift in the direction of lower fertility in the process of modernization: changes that occurred in some, especially early in the process, tended to push fertility up. The most obvious examples are reductions in breast-feeding and in the observance of prolonged post-partum abstinence (other examples include possible reductions in infecundity and sub-fecundity resulting from improved health conditions, and possible increases in coital frequency related to closer conjugal bonds). It is now abundantly clear that changes in these proximate determinants can act as a sponge, sufficient to absorb for a time the impact of fertility-reducing changes in other determinants (and thus giving rise to a sort of "germination period" during which overall fertility levels remain constant although fertility transition has, in a sense, already started) or even outweigh them temporarily (leading to an initial fertility rise rather than a decline). Widespread awareness that overall fertility levels may not fall, or may even rise, in the early stages of a fertility transition as a result of these forces is quite new. Its relevance is not restricted to those populations that are still in or just approaching this stage and that are thus facing a potential fertility rise: it may also be at least a partial explanation of why fertility did not decline for a while in some countries despite social and economic transformations and/or energetic family planning programmes - an explanation that forces us to reassess past experience.

More on the debit side, calls continue to be made for people to devote more attention to a life-cycle approach to the study of fertility, and to analyses centred on the timing of family formation - the patterns of starting childbearing, of spacing births and of stopping family formation - rather than concentrating almost exclusively on just one end-product, the quantum or overall level of fertility. Nor can the remarkable persistence with which most policy thinking continues to focus heavily on general indicators of the quantum of fertility fail to be noted. In terms of understanding fertility, the factors governing its tempo may be just as significant, in some cases more so, than those governing quantum, although quantum may be more dramatic and have a slight edge over tempo in terms of its consequences.

ADVANCES IN OUR UNDERSTANDING OF THE RELATIONSHIPS BETWEEN DEVELOPMENT, FERTILITY AND FAMILY

Overall progress

We are acutely, quite painfully, conscious of our failure to date to provide anything close to a full understanding of the interrelationships between development, fertility and family, to serve as a basis for policy formulation: we are not even particularly confident of our ability to do so (at least in the near future). This does not mean, however, that we should be too apologetic, for significant, even crucial advances have been made in the last decade. In some cases these consist of greater awareness of the difficulties inherent in the enterprise and of a clearing of the undergrowth through identification of approaches that are not likely to be very fruitful; in others we can discern more obvious gains.

Two main areas of concern can be identified: first, the type and level of analysis and, second, identification of those dimensions of family structure and function that are most intimately interlocked with modernization and fertility change. Finally, there is an increasing awareness that a number of aspirations regarding fertility and family may be contradictory.

The type and level of analysis

Most of the analyses to date, especially the empirical ones, have been carried out at the micro-level, focusing on the individual decision-maker. A number of very useful analytical models have been developed, such as the currently very popular framework for analysing the determinants of fertility (due to Easterlin), that set off factors determining the demand for children (the costs, broadly defined, of children, the social security they provide, etc.) against the supply of children in the absence of fertility regulation (the capacity for bearing children, or the supply of children) and the costs of fertility regulation.

Such models are clearly an advance over earlier models of the determinants of fertility developed largely from classical demographic transition theory. The use of them to date has, however, not been entirely satisfying. In large part this is perceived as being owing to a common failure to specify adequately the concepts involved and/or to substitute for them broad socio-economic indicators in empirical work. Plugging in education, for example, without specifying what it is about education that impinges significantly on fertility and why, has not always produced the neat, clear answers that many, whether naively or optimistically, have hoped it would, but if we use black-box approaches we must expect to get black-box results.

The second major source of the spreading dissatisfaction with the use of these models to date stems from the fact that they are most easily put into operation, indeed often actually cast, in terms of purely micro-level analysis. The institutional supports for and interrelations with particular patterns of fertility and family have tended to be neglected with resulting theoretical and practical impoverishment.

The increasing stress on understanding the institutional supports for and interrelations with fertility patterns is a very significant trend in recent research. It leads immediately to a shift in level as well as in perspective. Multi-level approaches, such as analysis of the individual in context, have been suggested and considerable research effort is now being channelled into such multi-level work. There is a feeling among some, however, - one might even say a nagging worry - that even this may not be fully appropriate.

The dominant theoretical context of the work of the Expert Group Meeting was modernization - whatever the exact definition used, a process of radical structural transformation with increasing differentiation based on division of labour. This definition refers inevitably, however, to an entire social system, implying the need for a macro-level approach - and inferring that an attempt to isolate and measure the impact of changes in certain variables (viewed as independent) on others (viewed as dependent) may result in misleading oversimplification or may even be irrelevant. Fertility and family change are just one aspect of a complex of interlocked changes in an integrated social and economic transformation: we cannot hope to understand the phenomenon fully if we restrict ourselves to the individual level, particularly if our approach is rather mechanistic.

The historical tendency for most demographers to shy away from macro-level work is doubtless related to the tendency to shun ideas that cannot readily be realized and expressed in terms of simple numbers that speak for themselves. It is true that macro-level theories are often extremely hard to put into operation and particularly hard to quantify effectively. However, the field concentration on quantitative (and rather mechanistic) work has tended to extend to all levels of analysis, including the micro-level. While not denying the significant contribution of quantitative work to the knowledge of fertility patterns, there is a growing, though still not yet widespread, recognition of its limitations and of the need for more good qualitative work and, in particular, for more attempts to combine the two.

Modernization, family and fertility change

The discussion here focuses on the interplay between modernization and two relationships that lie at the heart of the family - the relationship between generations and the relationship between the sexes.

Awareness has grown of the extent to which fundamental change in the family is an intrinsic feature of modernization. Although the family retains many of its functions, notably its reproductive and early socialization functions together with much of its affective role, it is shorn almost entirely of its economic function as the main unit of production and therefore its role is reduced as a source of security for individuals as they pass through vulnerable stages in the life cycle. And while it retains, by definition, its essence as one of the very few social groupings that bring together members of both sexes and of more than one generation, it is losing the traditional heart of this structure as a result of far-reaching changes in the relationships between generations and between the sexes. More specifically, emerging imbalances in the old exchange systems mean that traditional patterns of prolonged dominance of parents over children and of men over women undergo radical change. The two sets of changes are quite different from each other, however, because of fundamental differences in the exchange patterns and in the asymmetries involved.

Modernization, fertility and the relationship between generations. One of the most important advances of the last decade or so has been the development of greater insight into changes in the relationship between successive generations. The idea that fertility declines in the process of modernization because the cost-benefit ratio of children to parents declines has been with us for a long time, but more recent work, (Caldwell, for example) has not only reformulated the idea but has set it squarely within the broader context of intergenerational relations.

In the long run, intergenerational relations must take a form that ensures continuity of the population, essentially through the care and socialization of the young (but extended also to support for others at vulnerable stages of the life cycle, most notably the aged), largely through allocation of the time, and redistribution of the products, of those in other age groups, mainly those in the active age range. To be stable they must also be perceived as providing long-term distributive justice viewed over a typical individual's lifetime.

Traditional societies are now usually seen as systems in which individuals have a direct interest in relatively high fertility, in that advantages tend to accrue with age, with net transfers from young to old; in particular, goods, services and prestige tend to flow to middle-aged and older adults from children and young adults. The legitimacy of the system is usually not questioned because over a lifetime an individual who survives can reckon to break even. There is now a greater awareness of the ways in which demographic change, socio-economic development and modernization all combine to destabilize the system: the terms of the intergenerational contract

change, with fundamental implications for fertility and family in the long term and with considerable, sometimes dramatic implications for cohorts caught in mid-stream.

By definition, any marked demographic change will act as a destabilizing factor by changing the relative size of cohorts (and hence the magnitude of potential intergenerational transfers at any point in time) and/or changing the length of time individuals stay in a given status with its associated rights and obligations. Declines in mortality, for example, both increase the ratio of surviving sons to fathers and prolong the period in which adult sons are not themselves the senior generation. The first can be compensated by a reduction of fertility (although this may not occur immediately); the second cannot. Overall, what may appear at first sight to be a change that favours the older generations at the expense of the younger carries the seeds of its own destruction: the younger generations are increasingly likely to seek other institutional outlets outside the family, a process that ultimately reduces the functions of the family and the control that parents exercise over their children.

Any socio-economic change will also tend to destabilize the system, since its impact on the various cohorts is differential. A general destabilization may occur simply because change affects the various cohorts for different proportions of their lives: indeed, a change in the relationship between generations is a hallmark of development, for development can only occur if younger generations experience better conditions than their predecessors. The potential disruption of existing intergenerational relations comes not simply from the younger generations being able to enjoy the expanding cake for longer than their parents and grandparents, but rather from the fact that the older generations may even lose opportunities, status and authority to the younger because they are often less able to adapt to and acquire expertise and authority in the new ways. An additional destabilization comes from the fact that since any change catches the various cohorts at different points in the life cycle, it catches them at different stages in their progression through the succession of rights and obligations to their elders and their youngsters. As a result, a particular gain may be amplified for some generations and decreased (or even negated) for others, leading to marked potential imbalances and subsequent system adjustments.

Finally, the forms that modernization usually takes - in particular the spread of non-familial forms of production and of prolonged and non-familial forms of education that are associated with increasing specialization (and combined in most cases with the spread of welfare measures such as child labour laws and community-based rather than family-based old-age support) - reduce both the role of the family and the relative advantage to parents of high fertility. Under extreme conditions, children can even become a bad investment for individuals, for example, where some of the net costs of childbearing are still borne directly by the parents but where there is not a negligible risk that these direct costs may not be recouped in the form of greater support or prestige later in life.

Modernization, fertility and the roles of women. The interrelations between modernization, fertility and the relationship between the sexes are quite different: the issues are simpler in that the time element, so important in the system of intergenerational exchanges, is not so central. Again, however, there are emerging imbalances in the exchange system (here by the traditional concentration of child-rearing and domestic responsibilities in women and of many other functions in men) as the family sheds many of its functions and, in particular, childbearing in a woman's life diminishes. Here, too, a trend may be detected towards a more integrated approach in both research and policy formulation.

The general impact of modernization and development on the roles and position of women is a topic that went beyond the Expert Group's mandate: attention was focused on the interplay between fertility decline and the roles of women. Even within this more restricted area it is hazardous to generalize about women's position because of the tremendous variety of situations, and especially because of the great variations found in both traditional and modernized societies with respect to the visibility and recognition of women's economic roles and contributions and in their degree of independence. Some generalizations can be made, however.

The policy environment with regard to issues concerning women's position is significantly different in the mid-1980s from what it was at the time of the Bucharest Conference. The movement to improve women's condition has gained more momentum and wider acceptance. At the same time, however, there is a growing wariness of interventions designed to change the maternal role without appropriate associated changes in other spheres. Such interventions are increasingly perceived by women themselves as unacceptable manipulation. This does not mean that policies for fertility and the advancement of women have become disconnected - far from it: it means that the interlocks have to be considered more, not less, closely.

Fertility transition drastically reduces the extent to which childbearing and early child-rearing is a woman's life work in the sense that it is a central function and activity that absorbs much of her energies during most of her productive adult years. It fundamentally disrupts the exchange system between the sexes since traditionally women provided childbearing and child-rearing (together with domestic services) in exchange for economic support for most of their lives. It generates everywhere not just the possibility but also the necessity for women to be able to engage more in other economically and socially meaningful activities. Awareness of the magnitude of this change and of the extent of its implications is still spreading. Many women are unaware of its implications, especially in developing countries. Even in developed countries with their longer experience of relatively low fertility, the implications are still sinking in: one can cite here, for example, the reluctance with which some politicians have accepted that women cannot be viewed as a convenient reserve labour force that can be sent back to domestic activities and dependence whenever labour markets contract.

At the same time there is a growing realization that improvement in the condition of women itself implies that they be provided real social and economic options and that this in turn may moderate fertility. On the one hand, it is now fairly widely recognized that where the maternal role is still central, greater access to other meaningful activities in general and the acquisition of economic independence in particular may facilitate fertility decline by reducing the centrality of motherhood. On the other hand, where other roles are already more central and are potentially in conflict with family formation, realistic provisions to make it easier for couples, and especially for women, to combine parenthood with other activities may be needed to prevent fertility declining to extremely low levels.

Given all these changes, it would be logical to expect the International Conference on Population in Mexico City to spell out ways in which Governments can simultaneously achieve desirable fertility goals and an improvement in the position of women. To realize these goals, however, may require some hard thinking, courage and ingenuity, for there are still effective brakes and vested intrerests slowing down the improvement in the situation of women.

A major undercurrent in much discussion to date has been the understandable but potentially misleading tendency to avoid confronting some of the implications for men. While it is obviously desirable to improve the situation of women without deleterious effects for men - by enlarging the cake rather than by redividing it - there is, of course, a sense in which that is by definition impossible; where women are dependent and subservient they cannot cease to be so without men ceasing to exercise authority and control over them, and they cannot be freed of inferior status unless men cease to have superior status. The potential unpalatability of these long-term implications has understandably tended to focus attention on more specific short-run goals.

Even with specific short-run goals, however, the problem cannot always be avoided. The most striking current example relates to the fundamental issue of women's changing economic roles and of their increasing economic autonomy. Considerable attention was paid by the Expert Group to the special difficulties of increasing women's economic autonomy in a period of economic recession in general, and to the conflicts that might result from their entering the labour market in competition with men. Considerable concern was expressed that although the encouragement of women to enter the informal rather than the formal sector or to focus on new (usually small-scale) income-generating projects might provide a short-run solution, the implied perpetuation of sex-segmented labour markets and the risk of marginalization would not just be deleterious in the long run but also inequitable now.

Equally striking has been the resistance discernible to the small but growing body of evidence that an increase in egalitarianism in marriage (including a greater direct participation by men in domestic activities) might well exercise a moderating influence on fertility as well as improve women's position, facilitating fertility decline where fertility has been high, yet also preventing it from declining to extremely low levels where women have had other time-consuming roles and responsibilities that have been hard to combine with their traditional responsibilities. That men not only have a

responsibility to take a fair share of domestic duties (which was included in 1974 in the World Population Plan of Action), but also a right to participate directly in the early socialization of their children seems, however, to be regarded as currently unrealistic: it is perhaps an idea whose time has not yet come, but it is one that should be aired.

To sum up, there is now a greater awareness of the compelling need in both research and policy formulation to examine more closely not only the direct links between fertility and the position of women, but also the indirect links, including the other supports for existing power structures within the family and for sex-segmented labour markets.

Contradictions

There has been an increasing awareness of a number of potential contradictions in common aspirations, some of which are reflected in the WPPA. One contradiction noted quite forcefully at the Expert Group Meeting was that between the desire to preserve the family and the desire to reduce fertility and enhance the condition of women (and to improve life for younger generations): to paraphrase one of the participants, "We men want educated but obedient sons, high status but dependent wives". Indeed not all the concern expressed for preservation of the family refers to what is probably its most essential function, namely, that of providing an appropriate institution for ensuring the physical and cultural continuity of a population. Some may indeed veil a concern to protect particular power and authority structures, structures which, with modernization and fertility decline, tend to become increasingly inequitable.

It is probably impossible to achieve modernization in general and fertility decline and improvement in the condition of women in particular and still preserve the family, at least in its traditional forms. Elimination of newly or increasingly inequitable asymmetries within the family is not the price of this choice. The price is located rather in the need to build up appropriate non-family based support and solidarity systems to take over those functions that the family is decreasingly able to fulfil as the kin network shrinks and as the commonality of interests between family members also declines (as the family ceases to be the unit of production in particular and as development means that successive generations have quite different experiences). The most appropriate level for such systems - whether large-scale, e.g. national (comprehensive but anonymous) or small-scale, e.g. local (less comprehensive but more personal) - is a question that emerges again in the following section on policy.

A second potential contradiction is located in the ideal of the individual's freedom of choice with respect to family formation and the uncomfortable likelihood that individual decisions may not add up to what is in the collective interest. Discussion of this point belongs more properly in the next section, however.

POLICY FORMULATION AND IMPLEMENTATION

With respect to general advances in policy formulation and implementation, attention tends, understandably, to be focused predominantly on fertility rather than on the family. Four important trends can be discerned: (a) assessment of the potential utility and effectiveness of policy and programme efforts; (b) trends in the definition of desirable goals; (c) new directions in terms of the institutional means for achieving these goals; (d) shifts in perception of the individual's freedom of choice.

The utility of policy and programme development

Turning first to the initial premise that policies can have an impact, there seems to be a general consensus that policies to reduce fertility, either directly or indirectly, can indeed have an effect.

This is significant, perhaps surprising at first sight, given the fact that most attempts to measure the impact of population policies in general, and of family planning programmes in particular, have been suggestive rather than conclusive. Not only have there been difficulties in defining appropriate measures of programme input but there have also been fundamental difficulties in controlling other factors in a large non-experimental field. Moreover, one cannot deny the existence of mixed feelings about the effectiveness of policy measures intended to affect fertility whether upward or downward. While there is some evidence that population policies can have an impact, there is also a sense among some that, viewed in a longer-term perspective, we may be in a sense spectators of a large autonomous social change, with rather limited scope for intervention.

Nevertheless, at the Expert Group Meeting, the evidence appeared to be convincing that strong family planning programmes could indeed have a fertility-reducing impact and that when combined with strong socio-economic measures they could have a significant impact. Evidence that programmes to increase fertility could lead to a sizeable sustained increase was more meager, in part owing to the relative recency of most measures, and in part to the fact that many of the interventions tried had been rather superficial and/or piecemeal.

Policy goals: the setting of demographic targets

There also appeared to be a broad consensus at the Meeting that it was now more acceptable for Governments to set explicit, quantified fertility targets than it had been 10 years ago. Greater awareness of the consequences of demographic trends would explain this in part: there is certainly a widening awareness that demographic trends may jeopardize the attainment of other goals (such as provision of education or health services in many developing countries) or put at risk the meeting of existing commitments (such

as old-age security schemes). The harsh realities of the world economic situation and competing demands for scarce funds are another part and probably the main direct cause in many cases: in developing countries in particular, the role of the major funding agencies and their (increasing) tendency to stress explicit fertility goals have doubtless been a major element in this shift.

The way in which demographic targets are usually framed and discussed seems to deserve some reflection, however. It is striking that, just as a large proportion of demographic work continues to focus on overall fertility levels, most discussion of fertility goals continues to be framed in terms of overall indices such as birth rates, total fertility or completed family size. There is no reason, however, why targets should not be set in terms of other, more specific, fertility characteristics. A policy framed in terms of other characteristics may often be more relevant, more meaningful and/or more easily realizable. In many cases these targets will serve as a specification of how the broader demographic goals might be attained, but they may also be viewed as demographic goals in their own right. Reduction of childbearing at very young ages is a strong candidate since it can be proposed for a combination of widely acceptable social, economic and medical reasons as well as for its demographic impact, and it is usually the first to be suggested. Other targets, for example, the reduction of fertility rates among older women to reduce the number of high-risk pregnancies and to permit improved medical care for those that do occur, or maintenance of adequate birth-spacing, could both be promoted for health as well as demographic reasons.

It is striking that demographic targets are nearly always couched in terms of averages. Again there is no reason for this to be the only approach: it does not require much imagination to see the relevance of goals framed in terms of the distribution around that average, the variability. There is often little explicit reference, however, when demographic targets are spelled out, to which groups will contribute most to the projected change, and to which will reap the greatest benefits (or pay the highest price). It seems self-evident that in order to reduce inequities targets should at least be phrased explicitly in terms of the reduction of inequitable variability. For example, a reduction in the proportions of those that are involuntarily childless may well be an appropriate target in populations afflicted by high levels of infecundity; or, if a sharp fertility decline is considered a high priority, then the reduction of the number of families that exceed a certain size - or even the establishment of a maximum desirable family size - may help spread the burden of fertility change fairly equitably over all individuals. On the other hand, to assure some freedom of individual choice, targets intended to maintain or even increase variability may be preferred (so long as they do not result in increasing inequities in other respects) - a given proportion of small families if fertility reduction is desired, for example, or a given proportion of couples choosing to have more than two children where low fertility is considered a problem.

Institutional means and the organization of policy
formulation and implementation

The most appropriate types of organization for policy formulation and implementation, together with the level at which they best operate, constitute one of the central thrusts in the current population policy debate. A fundamental shift in the last decade is the current emphasis on mobilizing organizations at the community level (particularly in policy implementation) rather than relying on national effort from the top down. In part this shift may be simply a reaction to bad experience: the family planning community in particular was disappointed by poor results of centrally organized programmes and even burned its fingers. But sound theoretical reasons exist, too.

Two distinct arguments have converged here. The first concerns the specific nature of fertility and family as policy variables. Policy variables in general have typically been tackled through vertically-integrated, sectorally-managed organizational systems, either grafted onto existing specialized agencies or forming new, independent ones. Unlike some policy variables, however, fertility and family structure and functions are so deeply embedded in cultural and value systems that we should not expect them to be readily amenable to change through this type of approach: a comprehensive rather than a sectoral organizational framework would appear to be more appropriate (and, since it would probably be less strongly vertically-structured, it might also be more sensitive to local variations).

The second argument concerns the level at which policies directed towards a wide range of variables are best formulated and implemented; more specifically, the level at which the relevant social support and control systems can most effectively operate. It is commonplace to say that modernization is associated with a decline in family-based support, allegiance and authority structures and with an increase in the influence of the state. There are, however, other social groupings than family and state, often intermediate in scale between the two: for example, individuals and families continue to exist in a local context, which shapes many of the ground rules within which they operate. Local community and state are simply two extremes of scale on the present range of community-based as opposed to kinship-based support and control systems. An overly strong concentration on the national level may lead to neglect of other possibilities based on the smaller-scale, non-familial social groupings.

The idea of mobilizing institutions at a level intermediate between family and state - such as at the level of the local community - also has practical advantages. It not only permits better integration of fertility policies with other changes, but it also brings the costs and benefits to the group of the decisions made by an individual closer to that individual than is the case with a state-level system, thus, going part of the way to internalizing externalities. In addition, it permits greater attention to be paid to the difficult task of actualizing a policy, of translating the intentions into the mechanics of field operations that are sensitive to local conditions and appropriate to particular local needs. Finally, there are the

funding advantages - the piggyback effect - of linking fertility policy implementations to other institutions wherever appropriate institutions already exist or can be developed.

The community-level approach is rapidly becoming a rallying-cry for those involved in population programme efforts. It is, however, questionable whether the necessary institutional frameworks already exist or can be rapidly developed everywhere. A number of populations exhibit integration patterns that are not very promising because they lack the stable, broadly-based and comprehensive organizations (such as stable and effective local government structures) that appear to provide the most promising base. Moreover, even where suitable organizational bases exist, the local structural transformations that would be required in order to achieve a desired fertility change have barely begun to be investigated. The idea of community-level programmes is thus still a rather vague notion. Finally, although there is a strong feeling that small-scale support and control systems are needed to ensure a relatively direct and personal involvement, there is also a sense of caution among some, based on an uneasy feeling that attempts to stimulate small-scale institutions may be swimming against a strong current of long-term increases in scale (for risk-spreading, for example). The results of the approach might fall short of what is desired if an inappropriate level is chosen. It is certainly a challenging prospect and the approach is very attractive, but marching behind its banner means marching into largely uncharted territory with only a few models on which to base efforts: over-optimism now could mean an exaggerated backlash later.

The issue of choice

Finally, in the context of means and ends, the fundamental issue of the potential conflict between individual choice and societal goals continued to underlie much of the fertility policy discussion.

Given the secular trend towards increasing individualism in general and, especially during recent years, the trend towards spelling out a growing number of individual rights and their recognition as basic human rights, it is not surprising that the emphasis on individual rights found in the WPPA has been reaffirmed. Not only has the right of the individual/couple to choose with respect to family formation been reaffirmed, but a particular emphasis has been put on the requirement that people should have a real choice, that realistic options should be open to them. In this vein, considerable concern was expressed at the Expert Group Meeting about those types of incentives and disincentives that drastically restrict the range of options, especially if they are discriminatory, and certain other forms of manipulation of free choice (such as the withholding of information).

At the same time, however, a feeling that a greater stress should be put on the individual's responsibility to society when exercising that choice could be detected. It is improbable that states systematically and increasingly tend to underestimate the individual's responsibility to them: the source of this feeling must, therefore, be sought in other explanations.

One explanation is that the potential discrepancy between the sum of individual fertility preferences and the collective interest may have been underestimated. The observation that fertility decline tends to occur spontaneously in the process of modernization (if one can afford to wait long enough), with its corollary that fertility reduction programmes are essentially releasing, facilitating or accelerating an existing process, has probably played a significant role.**/ That any intervention, even one designed to harness and direct an existing force can lead to new, albeit temporary, imbalances between individual and collective interests was perhaps given too little consideration 10 years ago. The structural changes needed to make it in the individual's interests to take family formation decisions that are in accordance with the collective interest may also be harder to identify and to implement than was once thought. Certainly exhortation alone in the case of discordance is unlikely to have more than a marginal effect. A second potential explanation may be that this feeling may also reflect a more general shift within the scientific community that is not restricted to fertility and family issues, a retreat - as individualism spreads - from the prospect of unbridled forms of it and the widespread anomie and social fragility that might result.

SOME FINAL REFLECTIONS

There remains some final comments on two themes that have received relatively little attention, both of which are essentially anticipatory.

Anticipating potentially negative consequences of fertility decline

Can some of the less desirable consequences of fertility decline be anticipated in order to avoid or at least to reduce the problems that may ensue?

** Recent survey findings that a sizeable proportion of women in a wide variety of situations say that they do not want another pregnancy, although they are not taking any active steps to prevent one, have tended to boost the comfortable notion that individual and collective interests are broadly concordant (although some researchers question whether the findings reflect predominantly an unmet need for family planning services or an unmet need for other, structural change).

The consequences of declining fertility for the age structure have been known for a long time, but the stresses that a marked aging of the population may put not only on the economy in general but also on the inter-generational social and economic solidarity have received relatively little systematic attention in most countries until recently. This is true even in many low-fertility developed countries, partly because their post-war baby-boom gave a temporary respite to aging (although it will, in its turn, aggravate the problem 20 years from now). There is only the beginning of a realization in most of these countries that it will be extremely hard to maintain old-age care at current levels and to meet the commitments and expectations built up in a period of relatively favourable economic and demographic conditions.

Similarly, the shrinking of the network of kin that is a corollary of declining fertility has been obvious for a long time, but only recently is it beginning to be seen as having potentially stark consequences. The delayed reaction can be explained in part by the fact that the social security risks for exposed individuals can usually be spread over the wider community relatively easily when the number of isolated individuals is relatively small, and in part by the fact that the family and kinship group can still fulfil many of their integrative and affective functions even when the number of close kin are rather limited. It is, however, obvious that a significant rise in the proportion of one-child families and childless couples, like the rises now evident in a number of countries, inevitably implies that a sizeable proportion of the population will have very few or even no close relatives for long periods of their lives. The possible implications of this for social integration in different cultural settings and the potential alternative institutions that might effectively fulfil the necessary integrating functions are still largely unexplored areas.

What if there should be a desire to halt or reverse the trend?

Finally, once the genie of change is out of the bottle, where will it lead? Or, more specifically, once fertility, together with all that is interlocked with it, starts to change, where will it stop? There is no guarantee that a new stable equilibrium will be reached and that long-term fertility decline will end with fertility hovering around some desirable level (however defined). The hazardous nature of demographic forecasting is too well known to make predictions, but the current wisdom does suggest that, short of the emergence of some new configuration of natural forces, fertility decline may well continue below replacement levels, with all that this implies for the population in general and the family in particular. Very few of the dimensions of modernization to date act in any way other than towards reduction in both fertility and the functions of the family, and some of these (the emergence of women as more autonomous individuals, for example) have far from run their course even in developed countries. Moreover, many of the forces of modernization appear, at least from our present viewpoint, to be difficult to reverse if not well-nigh irreversible.

There may be no more than a couple of decades before the problem may start to appear more widely and more urgently: a period in which at least some attention should be paid to identifying new or existing forces that might halt or reverse fertility decline and to pinpointing potential interventions that could be adopted if necessary, without at the same time turning back the clock on gains that have been made so far in terms of the position of women and children and of respect for the individual.

II. FERTILITY DETERMINANTS

A. Fertility response to modernization

Moni Nag *

INTRODUCTION

Human fertility involves the physiological capacity of women and men to reproduce, individual choice and social control, all of which are influenced by processes included in the not-so-well-defined but widely used concept of modernization. Broadly speaking, modernization is a movement of socio-economic systems towards higher levels of development, as revealed by changes in socio-economic indices over time and by cross-sectional comparisons between countries or regions within countries. The level of such indices in the industrially advanced, urbanized and technologically sophisticated countries has produced the image of what is modern, providing a goal for the aspirations of less developed countries (Lerner, 1968). The institutional changes (for example, in organization of production) which have occurred in the developed countries (whether free market or centrally planned), or which are occurring in developing countries in the course of their development, will also be considered as processes of modernization for the purpose of this paper.

CONCEPTUAL LINKS BETWEEN MODERNIZATION AND FERTILITY

The most widely recognized fertility response to modernization is represented in the theory of demographic transition, which was derived from an attempt to explain the long-term shift in Western countries from a high fertility-high mortality regime to a low fertility-low mortality regime. This shift was attributed primarily to the development of modern technology, industrialization and urbanization, but the proponents of the theory were aware of the influence of other social changes associated with these processes (Notestein, 1953:18).

There are a number of possible approaches to analysing the relationship between modernization and fertility. One common approach is to regress a fertility measure on variables representing various aspects of social, economic and political modernization, along with other possible determinants of fertility. The variables used for the purpose usually include: proportion of the male and female labour force in non-agricultural pursuits, proportion living in urban areas, per capita income, literacy and educational levels, primary school enrollment, life expectancy, infant mortality, hospital beds, newspaper circulation, and so on. The regression analyses often reveal negative correlations between modernization variables and observed fertility,

* Senior Associate, Center for Policy Studies, The Population Council, New York.

but they fail to identify the causal mechanisms underlying the relationships. Also, negative correlations found in these analyses, along with the observed phenomenon of long-term fertility decline in developed countries, are apt to convey the incorrect impression that modernization can only cause decline in fertility.

The "intermediate" (Davis and Blake, 1956) and "proximate" (Bongaarts, 1978) approach to fertility variables developed recently has led to the introduction of a new stage in the analysis of the relationship between modernization and fertility. Fertility is seen here as determined by a set of intervening variables, with modernization, in turn, operating only indirectly on fertility through these intervening variables. 1/ The emphasis of the intermediate or proximate approach to variables is to assess the differential effects of intermediate or proximate variables on fertility rather than to assess the differential effects of modernization processes or other factors on these variables and, in turn, on fertility. This approach, commonly adopted by social demographers, stresses the supply (or production) aspect of fertility, whereas the approach of economists, who are concerned with explaining why individuals want or do not want to control births, tends to stress the demand aspect of fertility.

The analysis of the relationship between modernization and fertility requires the identification of appropriate intervening variables that cover both the supply and demand aspects of fertility. In this respect, the "synthesis" framework developed by Easterlin (1978) is very helpful and will be used, with some modifications, in outlining the contents of the present paper. According to Easterlin, the determinants of fertility can be seen as working through one or more of the following channels: (a) demand for children, (b) supply of children and (c) costs of fertility regulation. In a recent paper, Easterlin (1983) has suggested some specific ways that modernization affects the above three channels and how these, in turn, shape the trend in the use of deliberate fertility regulation as modernization progresses.

As the various aspects of modernization tend to be closely related to one another and it is very difficult to assess the distinctive effects of each one separately, this paper is not organized in terms of selected aspects of modernization, but in terms of selected intervening variables which are reasonably independent of each other. The intervening variables have been chosen on the basis of the following two criteria: (a) each variable has been reported to have either a positive or negative impact on fertility, directly or indirectly; (b) each variable has been reported to be affected by the processes of modernization in either a positive or negative direction. 2/ The eight intervening variables or sets of variables selected for analysis are grouped as indicated in the first section of this paper.

The discussion on each of the variables will include a brief description of the existing knowledge regarding (a) the nature and extent of its effect on desired family size and fertility, (b) the nature and extent of the effect of various aspects of modernization on the variable and (c) the implications of the findings for policy planning.

DEMAND FOR CHILDREN VARIABLES

Why people want children is a very difficult question to answer because it involves economic, social and psychological dimensions which cannot be easily disentangled and which vary tremendously among societies and among individuals within societies. However, extensive research on the value and costs of children during the past two decades indicates that economic dimensions are more important than others, at least in explaining the shift from a desire for a large number of children (say, six to eight) to a desire for a small number of children (say, two to three). Changes in the following three economic variables are found to be very relevant to this shift: (a) labour value of children to their parents, (b) children's value as old-age support and risk insurance to their parents and (c) economic costs of children to their parents. The only other demand variable considered here is infant and child mortality.

There are other social and psychological factors that could also have been considered as demand variables. For example, Bulatao (1979) has identified the following three: (a) the emergence of the conjugal family, (b) weakening cultural props for high fertility and (c) rising aspirations of parents. For the purpose of this paper, it seems preferable to consider them as aspects of modernization rather than as intervening variables.

Labour value of children

Economists concerned with the economic value of children to society as a whole rather than to their household have generally concluded that large families are economically disadvantageous in contemporary less developed countries (Coale and Hoover, 1958; Enke, 1966). These studies do not deal separately with the agricultural sector and also fail to recognize the interest of households needing a large number of children because of their economic contribution. It is logical to presume that the fertility levels of societies so structured as to make children economic assets to their households are higher than those structured so that children are an economic liability.

There is some empirical evidence regarding the relationship between labour value of children and fertility. In an analysis of the data available for 49 countries (developed as well as less developed) for 1960 and 1969, it has been found that the percentage of the population under age 15 who were economically active has a significant positive relationship with both crude birth rate and child-woman ratio (Kasarda, 1971:312). Recent surveys and village-level in-depth investigations in a few less developed countries also support the link between the labour value of children and fertility. Econometric analysis of fertility in Chile (DeVanzo, 1972) and the Philippines (Harman, 1970) has demonstrated significant positive correlations between measures of child participation in the labour force and birth rates. Time

allocation studies conducted in a few villages of Bangladesh, Java and Nepal (all characterized by high fertility levels) reveal that both boys and girls begin their working lives around six years of age and increasingly spend a significant amount of their working hours in productive and household maintenance activities (Cain, 1977; Nag, White and Peet, 1978).

The motivation for childbearing is highly complex and naturally it is extremely difficult to assess how far the parents in any society are motivated to have large families because of the perceived benefits of children as a source of labour. The Value of Children (VOC) project of the East-West Center at Honolulu provides some relevant information for seven less developed and two developed countries. The surveys conducted during 1975-1977 show that the percentages of wives and husbands mentioning "help in housework" or "financial, practical help" as advantages of having children generally declined in salience across countries as fertility fell (Bulatao, 1979:25).

Industrialization, improvement in income, urbanization and schooling are likely to reduce the labour value of children. The labour force participation data collected in national censuses tend to underestimate the proportion of economically active children, but they indicate clearly that as countries become industrialized and economically developed, the labour contribution of children declines (United Nations, 1962; Durand, 1975:95, 133). Although many children of poor families in the cities of less developed countries do paid as well as unpaid work, their labour value is much less than in rural areas with agriculture as the main source of livelihood. With an increase in income the need of parents for assistance from children diminishes. A country-level analysis of data regarding advantages and disadvantages of having children collected recently from 23 countries reveals that the single best predictor of the salience of help by children in housework (excluding economic and practical help) is lower per capita income (Bulatao, 1982:111). The schooling of children reduces their potential for work inside and outside the home not merely because certain hours are subtracted from the day by school attendance and homework, but also because it changes the value system of children and the aspirations of parents regarding children (Caldwell, 1980:227). It is reported that the major economic consequence of compulsory primary education introduced in post-revolutionary China is not the increased cost of tuition borne by parents but the lost labour the children could provide (Parish and Whyte, 1978:228). The required period of schooling for children increases with the need for a more highly trained labour force.

Of all the institutional changes that are related to the decline of children's contribution to labour, perhaps the most important one is the change from household organization of production to modern organizational forms in which the means of production are either owned and controlled by the state, or by other non-household enterprises, and labour is supplied by individuals in exchange for monetary compensation. As the difference between centrally planned and free market forms are mainly with respect to the ownership and distribution of the means of production, they can be lumped together in the modern category, as opposed to the household organization of production (Potter, 1983). The employment opportunities of children decline

in modern organizational forms mainly because the labour contracts are with individuals rather than households and the place of work is no longer the place of residence. The purely institutional effects of new institutional forms on child labour is, however, complemented by the effects of the shifts in technology, mechanization, specialization and required skill levels. Besides the historical experience of Western countries (Lesthaeghe and Wilson, 1979), a good example of decline in child labour through change in the social organization of production can be drawn from the recent experience of Brazil (Carvalho, Paiva and Sawyear, 1981; Gomez de Silva, 1975).

It should be noted that although modernization is likely to diminish the work value of children in the long run, this may not hold good in its early phase or under special circumstances. For example, the demand for child labour among the Javanese is reported to have increased when in the early nineteenth century the Dutch colonial rulers substituted labour to raise cash crops for the traditional land taxes (Geertz, 1963:69; White, 1973:231-232).

Of all the values of children to parents - economic, sociological and psychological - perhaps their work value is the one most capable of being influenced by policy. A change in the social organization of production induced by public policy is, perhaps, the most effective means of affecting the labour value of children in the long run. Legislation regarding child labour, compulsory education and free education are other public policy options that may influence the work value of children.

Children's value as old-age support and risk insurance

The theories linking economic development and fertility recognize that one main reason for high fertility in less developed countries is the parents' expectations of support from their surviving children, especially sons, in their old age. The decline in such expectations is presumed to be one of the ways in which economic development reduces fertility (Leibenstein, 1957:161). The three different types of evidence produced in support of this presumption are stated below.

The interview responses from parents in less developed countries generally show that the perceived importance of children as old-age support is a strong motivating force for having children. In the VOC studies mentioned above, the old-age security value of children, rather than their current work value, was found to be a more important reason for parents for wanting an additional child (Arnold et al, 1975:131-43). A striking illustration of correspondence between fertility and expectation of support from children is provided by two surveys conducted in Japan, where fertility declined rapidly in the 1950s. At the beginning of the decade, 55 per cent of a national sample expected to depend on children in old age but in 1961 only 35 per cent did so (Kobayashi, 1977).

A cross-sectional regression analysis using indices of extent of coverage and level of benefits in the social security programmes of 67 countries indicated that these programmes had about as much effect on fertility reduction as such traditional predictors as infant mortality, education and per capita gross domestic product (Holm, 1975). Although alternative analyses with the same data failed to turn up significant effects of social security programmes on fertility (Kelly, Cutright and Hittle, 1976), the effect of these programmes on fertility did not disappear entirely (Bulatao, 1982:105).

There is evidence of a pattern of co-residence of elderly parents with their grown children, mainly sons, in both more developed (earlier periods) and in contemporary less developed countries with high fertility levels. Anderson (1971:95), for example, found that in 1851, 72 per cent of married men over 55 who were engaged in agriculture in a Lancashire village were living with their children. Anthropological investigations conducted in Javanese and Nepalese villages during 1972-1973 showed that most of the elderly parents (over 60 years) lived with, or were very near to, one or more of their children and relied on them, rather than siblings or others, for their immediate day-to-day support (Nag, White and Peet, 1978:298-299).

Besides expectation of support of children in old age, parents in less developed countries are also motivated to have children as a source of insurance against risks of various kinds, such as drought, flood, earthquake, illness, death of spouse and loss of job. Perhaps the only study done so far relating fertility to children as a source of insurance against risk is by Cain (1981) in the context of rural Bangladesh and India. He found that the functioning of credit co-operatives and public relief employment schemes in the villages of the Indian states, Maharashtra and Andhra Pradesh, along with relatively greater access of women to productive activities made their inhabitants, particularly widows, less vulnerable to risk from natural disaster (e.g., flood and drought), and consequently less dependent on children as risk insurance than the villagers in Bangladesh.

It seems reasonable to infer from the above discussion that introduction of old-age social security programmes (as in developed countries) and other appropriate institutional changes (as in Maharashtra and Andhra Pradesh states of India) may contribute to a decline in the fertility level of less developed countries. But does it follow that such institutional changes are either necessary or sufficient conditions for fertility decline? There is at least some evidence from China that they are not necessary conditions and some evidence from pre-industrial England that they are not sufficient to explain fertility decline (Potter, 1983; Parish and Whyte, 1981:76; Smith, 1981).

Economic costs of children

Two types of economic costs of children can be distinguished: direct costs (e.g., for education, food, clothing) and indirect costs (e.g., employment opportunities that a mother forgoes). As direct and indirect costs of children increase as a consequence of modernization, fertility is likely to decline.

The financial burden due to direct costs of children is commonly cited by respondents in less developed countries when they are asked about their reasons for not wanting any more children or for limiting their family size. In the VOC studies mentioned above, "financial burden" was cited by respondents in the rural areas of all countries much more frequently than "restriction of freedom to do other things" as a reason for not wanting another child (Arnold et al, 1975:87). Caldwell and Ruzicka (1978:88-90) attribute the increasing cost for the education of children as the primary factor in the rapid decline of fertility in Australia during the last quarter of the nineteenth century. Among all items of direct costs of children to their parents, perhaps the greatest increase associated with industrialization in Western countries has been in educational expenditure (Espenshade, 1977; Minge-Kalman, 1977). There has been a rapid increase not only in the number of children attending schools and in the number of years of schooling but also in the cost of education per child. For example, Schultz (1974) estimated that the percentage rise in educational cost in the United States during 1900-1958 was about three and a half times as large as the rise in consumer income.

Mueller (1972a:182) has distinguished three types of opportunity costs of children: (a) certain consumption expenditures foregone in order to be able to afford children; (b) reduction of ability to save and consequent reduction of opportunities to make investments (e.g., in children's education, farm operations, family-owned business); and (c) foregone opportunities of (usually) the wife to earn income. The relative importance of the three kinds of opportunity costs is likely to vary according to the level of economic development. Large segments of the population in many less developed countries do not perceive any of the three opportunity costs as high enough to affect their family size desire because either the opportunities are not very relevant to them or are beyond their reach for reasons (social and economic) other than demographic. Mueller (1972b:182) reports that in Taiwan, rising aspirations for a better standard of living and technological developments such as the Green Revolution that raise the returns to investments (in one's own farm business and children's education) have significantly increased the first two types of perceived opportunity costs of children (thus affecting family size decisions), but the foregone opportunities for the wife to earn money have not played an important role there.^{3/} As in other less developed countries, extended family relatives or siblings share child-care responsibilities, leaving mothers free to work.^{4/} Moreover, since most women in rural areas of less developed countries work on the family farm or in a family business, they can watch their children while working. Even in urban areas where women are employed in construction projects, children often accompany them to the project sites.

Are there any policy implications from this discussion of the economic costs of children? One obvious implication is that the desire for a small family may become more widespread in less developed countries if suitable conditions are created by which the opportunity costs of children increase substantially. The measures most suitable for the purpose - increases in women's opportunities for jobs in modern sectors and in their educational levels - are in conformity with the general goal of development.

Any policy measure designed to increase the direct maintenance costs of children to their parents is not likely to be politically acceptable in most countries. The general trend in all less developed countries is to make parents increasingly free of the costs of health care and education of their children.

Infant and child mortality

The mortality level of a society is known to be related to its fertility level and it generally declines as the society is modernized. On the basis of a comprehensive review of the literature, Freedman (1961/62:17; 1963:114) concluded that a secular decline in mortality must eventually produce a decline in fertility and hence was a "necessary condition for an effective social policy for reducing fertility". So far as decline in fertility is concerned, reduction of infant and child mortality seems to be more pertinent than other components of mortality. Studies done with both aggregate and individual level data demonstrate a positive effect of infant and child mortality on fertility (McGreevey and Birdsall, 1974; Schultz, 1973). In a cross-cultural regression analysis Heer (1966) found infant mortality level to be one of the strongest and most consistent predictors of fertility level. However, a legitimate question to ask in this connection is whether the reduction in infant and child mortality is typically accompanied by equal reductions in fertility, so that there is no increase in the growth rate of the population. Micro-level studies regarding the impact of a child death in a family on the parent's subsequent fertility indicate that there is some fertility response to a child death but that "most families are unable or unmotivated to replace a deceased child with another live birth, additional to those that would be expected in the absence of child death" (Preston, 1975a:191). As most families would not replace the deceased child, the fertility reduction owing to "replacement effect" is likely to be smaller in magnitude than the mortality reduction.

There are, however, other mechanisms besides the replacement effect through which reduced infant mortality can and does reduce fertility enough in the long run so that the population growth rate does not increase but rather can decline as a consequence. One such mechanism is purely physiological and may be termed the "amenorrhea effect". Since the early death of a child interrupts breast-feeding, it shortens the period of post-partum amenorrhea, thereby increasing the probability of conception at an earlier date (Knodel and Van de Walle, 1967; Knodel, 1968). As infants survive longer, the period of amenorrhea increases, and the probability of conception decreases. The other two mechanisms are attitudinal and have been called "insurance motivations" and "fatalistic resignation" (Preston, 1975a:195).

As stated earlier, many parents in less developed countries depend heavily on children for old-age security and as insurance against various kinds of potential risks. As the degree of uncertainty regarding survival of children is high in many less developed countries, the most plausible

response of parents is to over-compensate for the loss of children. An actual reduction in infant and child mortality, accompanied by a perception of reduction in the degree of uncertainty, is expected to reduce fertility by somewhat more than what is implied by "replacement effect" and "amenorrhea effect."

Fatalistic resignation - an attitude that events are mostly outside an individual's control - is reported to be a main reason why many parents in less developed countries are not motivated to exercise control over their fertility. Reduction in mortality, especially infant, child and maternal mortality, and general improvement of health through the introduction of health services, are likely to make parents feel that at least a few important aspects of life are controllable and thereby make them more plan-oriented regarding their future. Such a change in attitude may encourage parents to make longer-term investments (e.g., in children's education and health), to want fewer children, and to adopt modern fertility regulation methods.

Decline in infant and child mortality is often attributed to one or more of the following aspects of economic and social development: (a) rise in per capita income and nutrition, (b) egalitarian distribution of income, (c) improvements in health technology and health services, and (d) progress in literacy and education.

A higher income at aggregate and individual levels is expected to cause decline in mortality because it is associated with increased consumption of items favourable to health, such as food and nutrition, medical and public health services, education, housing and leisure. Empirically, the negative correlation between national infant mortality rates and levels of income have been found to be consistently high, but income growth per se between the 1930s and 1960s has been found to account for only 10-25 per cent of the growth in life expectancy (Preston, 1975b: 232,237). Level of nutrition is often closely associated with that of income. By considering calorie consumption per head as a separate variable, Preston (1975b:239) found that it also could be ruled out as an important contributor to the increase in life expectancy. Improvement in maternal, infant and child nutrition is, however, likely to contribute significantly to the reduction of infant and child mortality in less developed countries.

In a cross-sectional analysis of data from 56 countries, Rogers (1979) found that income distribution was consistently and strongly related to mortality. This result should, however, be interpreted with caution because exceptions are not rare. Preston (1975b) found that life expectancy in Colombia, Mexico and Venezuela, countries with wide disparities in incomes, fell short of mortality levels expected on the basis of their mean income, but life expectancy in Eastern European countries, where income equality is expected to be greater than average, also fell short of expected levels.

In developed countries the validation of the germ theory of disease in the late nineteenth century and its impact on public health practices and technology had a significant impact on subsequent mortality decline. Demeny

(1965:210) thinks that the application of modern techniques of public health control in less developed countries, independent of income level and distribution, is the main reason for the uniform trend in post-war mortality decline. In less developed countries, higher levels of infant and child mortality in rural compared to urban areas can be largely attributed to the lesser accessibility of public health services to the rural population. A comparative study of mortality in Kerala and West Bengal states of India shows that greater accessibility of health services in the rural areas of Kerala is one of the main reasons for lower mortality in that state (Nag, 1981).

Although the mechanisms that link education and mortality are not well known, recent evidence from several less developed countries suggests that maternal education plays a major role in determining the level of infant and child mortality (Caldwell, 1979:396-400; D'Souza and Bhuiya, 1982:756-768; Preston, 1980:304-306). One possible mechanism is the greater awareness of the literate women of the need to use modern health facilities and, consequently, the facilities are used more by them than by illiterate women (Nag, 1981). Other mechanisms whereby education affects mortality are perhaps, through generating modern attitudes towards health, disease, nutrition, personal hygiene and sanitation.

The reduction of mortality, particularly infant and child mortality, is a social goal worthwhile for its own sake, but should it also be considered as a means of reducing fertility and population growth rates in less developed countries? The findings described above suggest that if fertility decline is the issue, a policy of mortality reduction, particularly infant and child mortality, is a promising avenue of attack. They tend to confirm the observation made in the World Population Plan of Action (WPPA) that the reduction of infant and child mortality has "an effect on the socio-economic context of reproductive decisions that tends to moderate fertility levels" (United Nations, 1975). If, however, the problem is defined as the rapid rate of population growth - a reality in many less developed countries - the policy of mortality reduction may not be an unmixed blessing, since it may exacerbate the population growth rate at least for a temporary period. The important consideration here is whether the problem of rapid population growth should be approached from a long-term or short-term perspective. A long-term decline in population growth rates in contemporary less developed countries cannot occur without a sustained and significant decline in fertility, which again, in turn, cannot occur without a similar decline in infant and child mortality. Moreover, improvement in health services and progress in education, which are the principal mechanisms for reducing mortality, are desirable social objectives in their own right.

SUPPLY OF CHILDREN VARIABLES

The supply of children or natural fertility variables are those determinants of fertility that affect the fecundity of women and men. The three sets of variables selected are: (a) age at marriage and proportion

never-married, (b) post-partum sexual abstinence and widowhood, and (c) infecundity due to breast-feeding, malnutrition and disease. The first two are related to fecundability and the third to fecundity. The impact of modernization on fertility through all demand variables is consistently negative. By contrast, the impact of modernization on fertility through the selected supply variables, with the exception of age at marriage and proportion never-married, is consistently positive. On occasion, the variables under the supply category may, in fact, also function as demand factors. For example, early or late age at marriage may be motivated by a desire for large or small family size. Similarly, breast-feeding or sexual abstinence may be practiced with a conscious desire for spacing or limiting family size. However, since in most societies these variables function predominantly as supply variables, they are considered as such in the present paper.

Age at marriage and proportion never-married

Reproduction, in the sense of childbearing and child-rearing, is one of the main purposes of the social institution of marriage. ^{5/} Increase in age at marriage, particularly of women, is expected to cause a decline in fertility since postponing regular sexual union reduces a woman's reproductive span.

There is evidence of a strong association between age at marriage and fertility in predominantly non-contracepting (natural) fertility situations. Crulai (France) and Ireland provide good examples. The historical demographic study of Crulai for the period 1674-1742 shows that the mean number of children per completed family was approximately eight, six and four for women who married on average at ages 20, 25 and 30 years, respectively (Henry, 1965). During the early part of the twentieth century considerable reduction of fertility in Ireland occurred owing to a very late age of women and men at marriage and to non-marriage of a considerable proportion among them (Lorimer, 1954: 171-176; Connell, 1965:428). Analysis of cross-national data provides evidence of a negative association between age at marriage and fertility, but the evidence is not very strong. For example, in an analysis of World Fertility Survey (WFS) data for 10 countries, McDonald, Ruzicka and Caldwell (1982:99-101) found "that country specific factors affecting marital fertility are sufficient to cloud the underlying relationship between age at marriage and fertility in cross-national comparison".

There is a consensus that fertility decline in Western countries, and in those less developed countries that have experienced a considerable decline during recent decades, is generally associated with an increase in age at marriage and proportions never-married. The less developed countries for which reasonably good evidence is available include the following: the Republic of Korea, Taiwan and West Malaysia (Cho and Retherford, 1973); Indonesia (Sinquefeld and Sungkono, 1979; Hull, Hull and Singarimbun, 1977); Sri Lanka (Fernando, 1976); Tunisia (Tabutin, 1979); and Turkey

(Ozbay and Shorter, 1969). It is difficult to estimate in quantitative terms the specific contribution of increase in age at marriage to fertility decline. There is some evidence to indicate that fertility decline in European countries as well as in Japan (Kobayashi, 1982) and Kerala (Panikar, Krishnan and Krishnaji, 1978) is characterized by a greater role of delayed marriage in the earlier phase and of marital fertility control in the latter phase of the decline. Taiwan, Province of China, provides an example of the reverse pattern (Freedman and Casterline, 1982:66-67).

The processes of modernization tend to erode many of the features of the traditional social structure, religious beliefs and value systems which promote early age at marriage. The ideal of patrilocal extended families and the importance of corporate patrilineal kin groups, such as lineages and clans, are two such features in many less developed countries (Lorimer, 1954:156-159; Davis and Blake, 1956:217; Davis-Blake, 1967:131-136). The dependence of newly married couples on these kinship institutions minimizes the necessity of their economic self-sufficiency prior to marriage. The relative lack of such institutions in Western countries is a factor responsible for delayed marriage in these countries, even in the pre-industrial period. In less developed countries marriage is customarily arranged by older kin who are eager to marry off girls quite early for reasons which include the following: (a) early marriage minimizes the stigma of childlessness; (b) loss of virginity or pre-marital pregnancy may bring disgrace upon the kin-group; and (c) marrying off children may be a religious duty. Modernization tends to erode the significance of these reasons.

In less developed countries the average age at marriage tends to increase with education, employment of women and urbanization (Dixon, 1971:217-18; Dixon, 1973). These are the processes that affect the role of women, familial relationships, kinship structure and religious beliefs in ways favourable to delayed marriage. There is, however, no linear relationship between age at marriage and modernization. For example, a pattern of delayed marriage and high proportion of never-married women existed in West European countries for at least two centuries before World War II (Hajnal, 1965).

Education of women is perhaps the most important factor causing a delay in their age at marriage. The average age at marriage of women generally is found to be higher in societies with a high proportion of literate teen-age girls (Dixon, 1971:216). Schooling may be a direct cause for delayed marriage in that girls are not usually married while they are still attending school or college, but is quite likely that in less developed countries the difficulty of finding appropriately qualified grooms for educated girls, and a modern attitude among parents who want their children to be educated, are more important reasons for the delayed marriage of educated girls. Evidence of a strong association between female education and age at marriage is available for many less developed countries. India and Taiwan, Province of China, provide good examples (Kale, 1969; Freedman and Casterline, 1982:68).

There are countries (e.g. Malaysia and Sri Lanka) where delayed marriage has contributed substantially to lower fertility but where there is little active government support for late marriage. Nevertheless, government

policies (e.g., China and Tunisia) designed to enhance women's status and autonomy do seem to have an impact on age at marriage in some countries (Henry and Piotrow, 1979:149). Policy options in the area of age at marriage differ among societies with varying cultural backgrounds and socio-economic characteristics. In the last three decades, several countries have raised the minimum age at marriage in the interests of child welfare and/or reduction in the rate of population growth (United Nations, 1972:111). There are, however, only a few countries which have actually set age at marriage at a level sufficiently high to have any effect on fertility. Moreover, owing to political and administrative constraints, few countries in the developing world are able to enforce delayed marriage legislation effectively.

Post-partum sexual abstinence and widowhood

Post-partum sexual abstinence. Sexual abstinence by women for a prolonged period after the birth of children is a common practice in many non-industrial societies. Data obtained from a sample of 41 such societies indicate a significant negative association between post-partum abstinence and fertility levels (Nag, 1962:77-81). However, for most societies in which post-partum abstinence is practiced for a prolonged period, it is not possible to separate the effects of breast-feeding and abstinence. Generally, post-partum abstinence is practiced for a shorter period than is breast-feeding. There are, however, exceptions, especially in Africa. For example, according to Caldwell and Caldwell (1977:197), the fertility level of most sub-Saharan societies is affected negatively more by prolonged abstinence than by breast-feeding. Post-partum abstinence is practiced more in African countries than elsewhere (Saucier, 1972; Schoenmaeckers, Shah, Lesthaeghe, and Tamashe, 1981). In most societies it is not a conscious fertility control measure; it is often justified on grounds of birth spacing for health reasons (Caldwell and Caldwell, 1977:198; Singarimbun and Manning, 1976:177).

There is ample empirical evidence of the decline in the duration of post-partum abstinence in all societies (Nag, 1980). In a comprehensive analysis of the practice in sub-Saharan Africa, Schoenmaeckers, Shah, Lesthaeghe, and Tamashe (1981) suggest that variation in the impact of early Islamization, intensive Christianization, and the use of coitus interruptus as an alternative child-spacing method, can explain a good deal of the degree of its erosion in various populations. In contemporary Africa, however, only minimal differences are found in the average duration of post-partum abstinence among different religious groups (Caldwell and Caldwell, 1981:186; Lesthaeghe, Page and Adegbola, 1981:160; Orubuloye, 1981:232). Of all the processes of modernization, education is found to have the greatest negative effect on post-partum abstinence; next in importance is urbanization (Caldwell and Caldwell, 1977:207; 1981:186; Lesthaeghe, Page and Adegbola, 1981:160-161). Since post-partum abstinence was traditionally observed more strictly by the polygynous sections of a society than by the monogamous sections (Krzwicki, 1934; Dorjahn, 1958:364), it can be presumed that the decline in its practice is associated with the decline of polygyny. But in

contemporary africa, there does not seem to be much difference in the practice among polygynously and monogamously married women (Caldwell and Caldwell, 1981:186).

The above discussion suggests that in some societies, particularly in Africa, decline in the practice of post-partum abstinence associated with processes of modernization may be responsible for some increase in the fecundability of women and, consequently, in their fertility. It is necessary for population policy planners to be aware of this phenomenon, but there seems to be little scope or reason for public policy intervention.

Widowhood/widowerhood. If all women and men of reproductive age remarried immediately upon being widowed, there would be no loss of their reproductive potential; however, this situation does not pertain in any society. Widowhood and widowerhood are everywhere a cause of loss of reproductive potential--the extent of loss depending on the mortality level of the society and customs regarding remarriage after being widowed. Mortality decline may cause a rise in fertility by increasing the duration of married life of couples even when their fertility behaviour within marriage does not change. A change in customs towards liberalization of remarriage of widows and widowers may also cause a rise in fertility by reducing the potential loss of their reproductive life. The proportion of widows and widowers (or couples in marital union) depends on the mortality rate as well as on the frequency and timing of their remarriage. Some indirect evidence on the relationship between the proportion of widows and fertility through these two variables is available for Latin American countries and India.

Mortality declined quite rapidly in Latin American countries during the last few decades, resulting in an increased life expectancy for both women and men and a decrease in the proportion of women of reproductive age living as widows. Arriaga (1970) estimated that in a group of 11 Latin American countries for which there was good evidence of a decline in mortality and an increase in fertility, women lived 6.3 years longer on average in marriages or unions under the mortality conditions of the 1960s than they did in the 1930s. He argues that the increase in the average life-span of men and women is the most important factor contributing to the increase in fertility measured by child-woman ratio.

In India, the percentage of widows among all females declined from 16.0 in 1930 to 8.9 in 1971. Two different processes of modernization have caused this decline. First, the gradual improvement in health conditions has increased the longevity of men, thus delaying the widowhood of women. Agarwala (1965) estimated that the mean age at widowhood in India increased from 34.4 in 1901-1911 to 38.3 in 1951-1961. Second, the gradual relaxation of the customary ban on remarriage of Hindu widows, which applies more to the upper castes, has led to an increase in the frequency of widow remarriage. By analysing Indian census data from 1901 to 1941, Davis (1951:80-81) concluded that the custom of non-remarriage of widows among Hindus was the main reason why their fertility had been consistently lower than that of Muslims. Frequency of remarriage of widows has been increasing as a result of educational progress and social reforms.

Reduction in mortality (or increase in life expectancy) is a universal social goal. Relaxation of the ban on the remarriage of widows or widowers, if any, is also a socially desirable trend. There does not seem to be any justification for impeding these trends, even if they are in conflict with the objective of reduction in fertility or population growth rates.

Infecundity due to breast-feeding, malnutrition and disease

Breast-feeding. The fecundity-reducing effect of breast-feeding is now an established scientific fact (Simpson-Herbert and Huffman, 1981; Van Ginneken, 1974). At least up to 1974, the contraceptive protection provided by breast-feeding in less developed countries is estimated to have been greater than that achieved through family planning programmes (Berg, 1973; Rosa, 1975). A change in the total duration of breast-feeding depends on one or more of the following three factors: (a) the perceptions of parents and the community about what is good for a child's physical and mental health; (b) the availability of breast-milk substitutes and the parents' ability to afford them; and (c) convenience and socio-cultural support of breast-feeding for the mother. The processes of modernization that are likely to bring changes in these three factors are: education, urbanization, nature and location of mother's work, the availability of powdered milk, modern health services and other socio-cultural changes (Nag, 1983).

A number of recent surveys in less developed countries including the World Fertility Survey (Jain and Bongaarts, 1981; Kent, 1981) have indicated a negative relationship between education and breast-feeding. At the individual level, education is the most important factor influencing the decline in the duration of breast-feeding in less developed countries, although the extent to which the duration declines at different educational levels is not uniform among different countries (Nag, 1983). In contemporary developed countries the greater spread of education at higher levels tends to have a positive effect on breast-feeding, at least in recent years; however, the effect of added education at lower levels shows no consistency (Hirschman and Sweet, 1974: 49; WHO, 1979).

There are large rural-urban differences in the duration of breast-feeding in less developed countries. It is likely that most of these differences can be explained by the higher educational and employment opportunities for urban women and the wider use of breast-milk substitutes in urban areas. Women employed outside the home in non-agricultural work are generally found to breast-feed less than others, while those employed in agricultural work seem to breast-feed more than non-working women (Butz and DaVanzo, 1981; Knodel and Debavalya, 1980: 366-370). One of the main reasons for the decline of breast-feeding in less developed countries is the introduction of powdered milk and feeding bottles. Aggressive media campaigns of commercial manufacturers of baby milk powder, together with the convenience of bottle-feeding, initially attract women of higher socio-economic status in urban areas. In turn, the prestige value of this modern behaviour, along with

the encouragement from public health service personnel, makes it spread among poorer urban and rural women. Examples of such change abound in the current literature (Greiner, 1979:67; Morgan, 1971:110; WHO, 1979).

Some psychological and cultural changes related to modernization are known to be associated with a decline of breast-feeding. It is known that many women need psychological and social support in breast-feeding (Raphael, 1979: 30-32); such support declines with the erosion of the extended family and other traditional kinship structures. Modernization may bring about a change in the concept of female breasts from a symbol of nutritional and emotional nourishment for a baby to that of sexual attraction. Such a change, along with the not-uncommon belief that breast-feeding may cause the breasts to sag, is an important factor inhibiting women from breast-feeding in developed countries as well as in urban areas of less developed countries. The sense of modesty among women about exposing their breasts in the presence of others--a characteristic related to modernization at least in less developed countries--is likely to be linked with the decline in the practice of breast-feeding.

If the use of fertility regulation methods is less than what the fertility policy of a country requires, the issue of controlling the decline in breast-feeding, if any, may become an aspect of fertility policy. In reality, however, the issue of breast-feeding versus bottle-feeding has become a matter of international debate mainly due to its relationship to infant health and mortality. There is sufficient evidence to demonstrate that for the first few months, breast-feeding is better than bottle-feeding for infants' health, especially for the poor living in unsanitary conditions. It is not, however, easy to reverse the decline of breast-feeding in any society. Public education about the benefits of breast-feeding, the control of powdered milk industries, and the orientation of public health personnel in favour of breast-feeding are possible measures that can be employed, but studies regarding their effectiveness are rare.

Malnutrition. It is argued that a minimum level of stored energy is required for the maintenance of a regular ovulatory menstrual cycle and hence malnourished women have a longer period of amenorrhea while lactating than well-nourished women (Frisch, 1975:20). The findings obtained from a few recent studies indicate that malnutrition does lengthen the period of amenorrhea, but not to any great extent--much less than that due to breast-feeding (Bongaarts, 1980). The lengthening of the period of amenorrhea may be significant, however, in cases of severe malnutrition (Gray, 1983).

There are large individual and group variations in age at menarche and menopause. A consensus exists on the basis of considerable empirical evidence that improvement in nutrition does advance the age at menarche. Although there is some evidence to suggest that poor nutrition may be associated with an earlier menopause, it is not strong (Gray, 1983). In any case, the overall effect of malnutrition on the reproductive span of a woman is likely to have only a small impact on the completed fertility of a woman, since it involves

only a small fraction of the reproductive span of more than 30 years and since her fecundability is relatively low for some time after menarche and before menopause for reasons unrelated to nutrition (Leridon, 1977:37-39).

Although the view is that widespread maternal malnutrition is a cause for intra-uterine mortality (miscarriage and stillbirth), the evidence for this relationship is inconclusive (Nag, 1980). The incidence of stillbirth, however, appears to be somewhat higher in less developed countries (malnutrition may be a major contributing factor), but stillbirths constitute a small proportion of intra-uterine mortality (United Nations, 1973:122; Gray, 1983).

The evidence presented above suggests that improvement of nutrition among malnourished women in less developed countries may increase their fecundity, and thereby fertility, but to a very small extent. The processes of modernization that are usually associated with improvement in nutrition of women include rise in income, better distribution of income, progress in education and literacy, advance in technology of food production and preservation, enhanced status of women and dissemination of nutritional knowledge through mass media and demonstration. From the policy point of view, improvement of nutrition of all malnourished persons should be a goal for its own sake. It should be pursued even though there is a likelihood of increase in fertility. In the long run, the improvement may cause a decline in infant and child mortality and, thereby, a decline in fertility.

Disease. Two diseases that are reported to cause intra-uterine mortality are venereal syphilis and malaria. There is some evidence of a correlation between the frequency of miscarriage and serological reactions to syphilis in three francophone African countries (Retel-Laurentin, 1979) and between a low birth rate and serological reactions to syphilis in Zaire (Romaniuk, 1968), but there is no direct evidence linking syphilis with a demographically significant increased prevalence of miscarriage. Similarly, there is some circumstantial evidence to suggest that malarial infection impairs fetal nutrition, which may increase the likelihood of intra-uterine mortality, but there have been no surveys directly linking the prevalence of malaria to the prevalence of intra-uterine mortality. The lack of any hard evidence suggests that the effect of any disease on intra-uterine mortality, if any, is small (Gray, 1983).

Although a few other diseases, such as genital tuberculosis, schistosomiasis and filariasis have been implicated as possible causes of sterility, available epidemiological and clinical studies suggest that sexually transmitted diseases, predominantly gonorrhea, are the major causal agents of both primary and secondary sterility. The prevalence of gonorrhea and its association with both primary and secondary sterility have been reported for a number of societies, particularly in the Africa, the Caribbean and Oceania. An improvement in public health facilities for controlling venereal diseases is known to have increased fertility in some of these societies (Gray, 1983, Nag, 1980).

Thus, there is strong evidence that demographically significant levels of sterility are associated with a high prevalence of sexually transmitted diseases, predominantly gonorrhea. Perhaps very few societies with such levels of sterility exist in the contemporary world. Antibiotics and the introduction of modern health services can reduce the prevalence of diseases causing sterility. Measures to prevent and cure such diseases should, of course, be promoted in all countries where they prevail, even if they contradict a policy of reducing population growth rates.

COSTS OF FERTILITY REGULATION

If the demand for children or the desired family size of a couple exceeds the supply of children or the potential family size, there is no reason for the couple to try to limit its fertility, unless pressured or coerced to do so. If, however, the demand for children is less than its supply, the couple may want to regulate its fertility. But whether or not it will actually do so depends on actual and perceived costs of fertility regulation. If the costs are weighed by the couple as too high compared with the benefits of a small family size, the couple is likely to end up with what is known in demographic literature as "unwanted" children. In 17 out of 20 less developed countries where the WFS was conducted, at least 40 per cent of "exposed" women (currently married, non-pregnant and fecund) who said they did not want more children were not using any contraceptives (Johnson-Acsádi and Weinberger, 1982). Apparently, a large proportion of couples in less developed countries prefer to bear the burden of unwanted children rather than incur the costs of deliberate fertility regulation.

Physical, psychic and monetary costs

Physical costs. Almost all fertility regulation methods including induced abortion - despite radical technological improvements - involve some physical costs on the part of their users in the form of minor side-effects and/or serious health hazards. The only methods that may be categorized as free of physical costs are coitus interruptus, abstinence and barrier methods (condoms, diaphragms etc.); however, they are difficult to use and often only partially effective. The principal side-effects and health hazards of the three most widely used contraceptive methods in the contemporary world - oral contraceptives, sterilization, intra-uterine devices (IUD) - have been recently reviewed by Schearer (1983). The most frequent major complications of illegal abortion are pelvic infection, hemorrhage, shock and trauma to the pelvic organs; in most less developed countries, mortality associated with illegal abortion is probably about 50 to 100 deaths per 100,000 abortions (David, 1983).

What is the impact of the serious health hazards and minor side-effects of fertility regulation methods on their use and on fertility? In developed countries, as knowledge about hazards has increased and has been disseminated

widely in recent years, there has been a reduction in the use of more hazardous methods -oral contraceptives, IUD and injectable contraceptives- and an increase in the use of less hazardous ones, sterilization and barrier methods. In these countries, minor side-effects do not appear in themselves to be important determinants of acceptability of fertility regulation methods, and the effect of the shifts away from more hazardous methods on fertility, if any, will be negligible. By contrast, the acceptability of fertility regulation methods in less developed countries is determined more by their minor side-effects than by their serious health hazards. The physical costs of fertility regulation in the form of minor side-effects of available contraceptive methods have, in all likelihood, a significant impact on the fertility level in many less developed countries (Schearer, 1983).

Psychic costs. Psychic reasons for which individuals may not use fertility regulation methods even when they want to limit or space births may be grouped under the following four categories: (a) fear of potential health hazards from specific methods; (b) sacrifice of pleasure involved in specific methods; (c) embarrassment related to sexual modesty; and (d) conflicts involved in challenging traditional beliefs and values.

It has been mentioned above that the minor side-effects caused by some contraceptive methods often generate fear of health hazards for which there is often no objective basis. As changes in the menstrual pattern are common side-effects of some contraceptives (especially oral contraceptives and IUDs), varying perceptions of menstruation among women in different cultural groups are reported to hinder - or sometimes enhance - acceptance of particular methods (WHO, 1981). The fear of potential hazards from specific methods, however, is not always based on apparent side-effects. For example, reports from villages in the Dominican Republic, India and Mexico indicate fears about IUDs which are unrelated to their side-effects (Shain, 1980), and anxiety about the possibility of impotence from vasectomy is not uncommon (e.g., Nag, 1966).

A few contraceptive methods cost their practitioners a part of the pleasure derived from sexual intercourse. The rhythm method requires abstinence for a number of days every month. Since women usually do not have sexual intercourse during their menstruation, the period of menstrual abstinence becomes longer when they use any contraceptives (e.g., IUDs) which tend to prolong the duration of bleeding. The cost of interference in sexual pleasure involved in coitus-related methods (e.g., condoms, diaphragms, foams, coitus interruptus) is one main reason for the growing popularity of coitus-unrelated methods (e.g., oral contraceptives, sterilization and IUD).

The use of some contraceptive methods, as well as medical examination and consultation necessary for the purpose, often violates the sense of sexual modesty that many women and men have. Lack of privacy in many family planning clinics is a source of great embarrassment for clients when they are asked questions related to their sexual behaviour or physically examined in the presence of others (e.g., Scrimshaw, 1976). Difficulties related to sexual

modesty are experienced by men also. For example, in most countries men are still embarrassed to buy condoms from stores or to get them from clinics in the presence of others.

When an individual wants to use a fertility-regulating method and finds that the cultural values in his or her immediate environment are against the use of that specific method or against birth control in general, there is always a psychic cost in challenging the pro-natal or anti-regulatory viewpoint which is often supported by traditional beliefs and values. Generational differences in attitudes towards childbearing are known to hinder acceptance of family planning in many less developed countries.

Monetary costs. Schearer (1983) estimates that in 1980 the yearly private-sector average cost for the four most popular methods (the pill, IUD, condom and female sterilization) were remarkably similar in most less developed countries, ranging from \$US 23.00 to US\$ 34.00. These costs are substantial compared to local per capita income levels (ranging from 1 to 5 per cent of per capita GNP). In developed countries the monetary cost of contraception constitutes a small portion of per capita income and has virtually no impact on overall use of contraceptives, but Schearer provides evidence indicating that monetary costs of contraception influence both the mix of methods and the overall use of contraceptives in less developed countries. The high cost of public-sector family planning programmes has limited the extent of their coverage as well as the methods they can provide, and is thus a barrier to the use of contraceptives in most less developed countries (Rodriguez, 1978; Fincancioglu and Schearer, 1981; Anderson and Morris, 1981).

Impact of modernization on costs and policy implications. Two major aspects of modernization that have direct bearing on all three types of costs of fertility regulation are advancement in birth control technology and family planning programmes. The other aspects that indirectly affect costs are education and urbanization.

A revolutionary improvement in contraceptive technology as well as in abortion technology during the last three decades has changed the relative mix of fertility regulation methods in all countries and has contributed significantly to a wider practice of birth control by reducing its physical, psychic and monetary costs. The above discussion indicates, however, that all existing methods still entail costs of various kinds which limit the extent of their use. The improvement of existing methods and the innovation of new methods through further research and advanced technology can reduce and, perhaps, eliminate some of these costs.

By providing fertility regulation devices and services free of charge or with a nominal fee, family planning programmes in many less developed countries have virtually eliminated monetary costs to their users. They have also reduced the physical and psychic costs of fertility regulation. There is a continuing debate regarding the relative contributions of socio-economic development and family planning programmes in fertility reduction or in

increasing an acceptance of fertility regulation methods, but there is little doubt that a large section of the poorer people in less developed countries who have accepted modern methods would not have done so if there were no programmes. However, a tremendous scope still exists for reducing all three types of costs of fertility regulation for millions of people in less developed countries by strengthening existing programmes and establishing new ones.

Education can reduce the physical and psychic costs of fertility regulation, since educated persons are likely to be more knowledgeable than uneducated ones about the advantages and disadvantages of specific methods and hence capable of making a better choice of methods suited to their individual needs. They are also likely to incur less monetary costs since they are better informed about the facilities provided by family planning programmes. The costs of fertility regulation are less in urban areas than in rural areas mainly because the family planning centres are more accessible in urban areas.

POLICY IMPLICATIONS

Individual choice plays a role in the fertility behaviour of couples in every society, but the "proximate" variables which determine their actual fertility performance are influenced to a great extent by social values and institutions. In this sense there has always been some social control on the fertility level of any society. State intervention in fertility regulation is, however, a recent phenomenon, stimulated mostly by the rapid rate of population growth in many less developed countries and by the Governments' perception of it as a hindrance to economic development at the national level. At present a large percentage of the total population in the third world live in countries which have adopted a policy of fertility reduction. Family planning programmes represent the most common measure through which such a policy takes shape. Family planning programmes can be considered as an aspect of modernization since their main objective is to provide information, materials and services regarding modern contraceptive methods. Although in principle the programmes in some countries include activities designed to reduce the demand for children by influencing childbearing norms and motivations, in practice the programmes affect fertility mainly by reducing all three types of costs of fertility regulation - physical, psychic and monetary.

The policy implications, if any, of the findings related to the relationship between processes of modernization, on the one hand, and the eight variables or sets of variables grouped under three categories have been included in the discussion above for each variable or set of variables. They are summarized below.

Demand for children or desired family size has been found to decline as the economic value of children to their parents decreases and economic costs increase. The labour value of children - one of the two main economic

values - is known to decline with urbanization, improvement in income and progress in education - processes usually associated with industrialization. The relevant question for many less developed countries that do not have any prospect for rapid industrialization in the near future is whether other feasible measures can be taken to reduce the labour value of children to their parents. Legislation regarding child labour and compulsory education seem to be effective only when economic, social and political conditions are ripe. There is some indication that the labour value of children declines with a change from household organization of production to modern organizational forms in which the means of production are either owned or controlled by the State or other non-household enterprises. Such institutional change can be accelerated through various forms of state intervention.

In less developed countries only the Government and other organized sectors related to large-scale manufacturing industries provide old-age pension and insurance benefits against a few types of risk. The bulk of the population, particularly in rural areas, are not employed in these sectors and have to depend upon their children for economic security in old age and against various risks. In order to reduce the old-age support and risk insurance value of children, institutional social security systems, whether operated by the Government or non-Government agencies, should be expanded on a major scale. Various forms of co-operatives, unions, credit and saving institutions, life insurance agencies etc. can be developed to suit the local conditions. Although beset with many difficulties, success stories of such institutions are not unheard of, as exemplified in Maharashtra and Andhra Pradesh states of India (Cain, 1981).

The opportunity costs of children as well as the direct maintenance costs to their parents increase as society modernizes. The opportunity costs of children to their parents can be increased by expanding women's job prospects in modern sectors and by enhancing their educational levels. These measures are in conformity with the general goal of development. Any advantage of fertility decline expected from policy measures designed to increase the direct costs of children to their parents is likely to be outweighed by the harmful consequence of such measures on the quality of life of the poor.

Reduction of infant and child mortality can cause fertility decline by reducing both the demand for children and the supply of children. Rise in per capita income and better distribution of income seem to have some negative effect on mortality. In less developed countries, however, the uniform trend in post-war mortality decline can be attributed more to the application of modern techniques of public health control and the widening distribution of modern public health services. Progress in women's education has been found to play a major role in determining infant and child mortality. Health and educational services - and their better distribution - should be considered as vehicles for the reduction of infant and child mortality, in addition to their value as strategies for other development goals.

Fertility decline in developed countries as well as in those less developed countries that have experienced considerable decline in fertility during recent decades has generally been associated with an increase in age at marriage, particularly of women. Progress in women's education and expansion of employment opportunities for women are linked with delayed age at marriage. Policy measures to enhance women's status and autonomy seem to have an impact on their age at marriage. Raising the legal minimum age at marriage may be helpful in creating a social environment for delayed age at marriage, but very few less developed countries have the administrative machinery to enforce marriage legislation effectively.

Decline in the practice of post-partum abstinence and decline in widowhood/widowerhood are known to be associated with some aspects of modernization and also with increased fecundability of women and, consequently, their increased fertility in some less developed countries. Since the associated aspects of modernization (e.g., progress in education and expansion of public health services) are desired development strategies in all societies, there seems to be hardly any scope or reason for controlling the declining trend in the practice of post-partum abstinence and widowhood/widowerhood.

Decline in the practice of breast-feeding is responsible for an increase in fecundity and, consequently, in fertility in some less developed countries. The current policy concern, however, regarding the decline of breast-feeding in less developed countries is not related to its effect on fertility but rather on infant and child mortality. It is not clear what specific policy measures are effective in controlling the decline in the practice of breast-feeding.

As stated above, family planning programmes have contributed substantially to the decline of fertility in many less developed countries by reducing the physical, psychic and monetary costs of fertility regulation to individual couples. There is evidence that the acceptance of family planning in many countries may increase further if the costs of different types are reduced further. It is possible to do so by strengthening the existing programmes and establishing new ones. Further advances in the knowledge regarding human reproduction and in the acceptability of contraceptives can also reduce further all three types of costs of fertility regulation. Progress in education and the spread of urbanization are also helpful.

Notes

1/ Davis and Blake (1956) identified 11 "intermediate" variables through which and only through which modernization and other processes could affect fertility. By analysing the possible impact of these 11 variables, Bongaarts (1978) succeeded in identifying the following four "proximate" variables, which can explain most of the fertility differentials among populations: proportion married, contraception, induced abortion and lactational infecundability.

2/ There are variables that are known to have some effect on fertility, but it is not clear whether or not they are affected by modernization and if affected, in which direction. They have been excluded from the framework of this paper. Divorce/separation, frequency of coitus and involuntary abstinence are examples of such variables (Nag, 1980:578-579).

3/ Freedman (1976:357-358) argues that the introduction of mass media and the availability of modern consumer goods - two obvious manifestations of modernization - in Taiwan, province of China, have contributed considerably to the rising aspiration of parents for a better standard of living.

4/ The time allocation data collected in one Javanese and one Nepalese village in 1972-1973 show that although children require a lot of care in the first few years, most of the time spent in child care is spent not by mothers but by other household members, especially the older siblings (Nag, White and Peet, 1978).

5/ For the sake of brevity and simplicity, the discussion in this paper is confined to age at first formally recognized marriage only and mainly to monogamous societies which have sanctions against reproduction prior to a formally recognized marriage.

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B. Content and process in fertility decisions:
A psychosocial perspective

Rodolfo A. Bulatao*

INTRODUCTION

Research into the determinants of fertility has traditionally begun with the influence of an individual's or a couple's education, income, residence, and similar characteristics. Instead of looking at fertility from the perspective of such social classifications or labels, this paper attempts to present a coherent account of fertility decisions from the individual's perspective. The problems of decisional perspectives are several; these are considered first, and some very general terms are laid out to provide a structure for the discussion. The paper goes on to review the content of fertility decisions and the process by which decisions are arrived at. Highly selective use is made of a recent report from the Panel on Fertility Determinants of the United States National Academy of Sciences (Bulatao and Lee, 1982a), which attempts to integrate research on fertility determinants in developing countries. While this report starts with a framework for analysing fertility determinants and assesses evidence within its categories, ^{1/} the present paper, by contrast, starts with subjective perceptions that enter into decisions and works toward an essentially similar framework.

Studying fertility decision-making

Fertility decision-making is the focus of or a basic postulate in many theories of fertility. Micro-economic theories of fertility, like those of Becker (1960), Willis (1974) and Easterlin (1978), assume that reproductive behaviour is a response to underlying preferences for children and the constraints on having them imposed by external factors; that fertility decisions are made is therefore assumed. Some psychological theories are concerned with the decision process itself or the rules governing it (e.g., Fishbein, 1972; Hass, 1974), whereas others, while not explicitly concerned with this process, investigate individual preferences and values which are relevant if decisions are actually made (e.g., Hoffman and Hoffman, 1973). Among anthropological approaches, several discuss fertility determinants at the societal or cultural level with no reference to couples making decisions, but others focus specifically on such decisions (Bartlett, 1980; Hull, 1982).

* East-West Population Institute, Honolulu.

All these theories commonly confront a number of problems in dealing with fertility decisions, and resolve them in several different ways. To be considered first is the topic of decision outcome that is the focus of interest. Next will be the problem of handling non-decisions, or cases in which decisions appear not to be made. Then, ways will be discussed in which decision approaches identify key elements and therefore simplify the task of analysis. Finally, the handling of determinants of behaviour that are beyond the reach of decisions will be considered.

Specifying outcomes

Research into decisions typically deals with one or the other of the two important outcomes of this process--childbearing and the use of contraception (or induced abortion)--and seldom with both simultaneously. These two outcomes are necessarily linked, since limiting childbearing requires some form of fertility regulation. Nevertheless, research sometimes concentrates on factors entering decisions about family size or about having a particular child while paying minimal attention to the behaviour required to effect such choices, or it focuses on the considerations related to contraceptive use while putting little emphasis on family-size preferences. The fact that many women in developing countries desire to limit their families but fail to use contraception (e.g., Westoff, 1981a) affords some surface plausibility to the separation of these approaches, though it also indicates a major problem with taking either approach in isolation. Convergence of these approaches is certainly possible and desirable.

Other behaviours are also relevant to fertility, and also involve some amount of decision-making, but they have received much less attention within decision frameworks. Breast-feeding, marriage, and the frequency and timing of intercourse, in particular, are important behaviours with great influence on fertility. Investigation of the decision elements that enter such practices, however, is very limited (but see, e.g. McDonald, 1981).

Handling non-decisions

That individuals and couples sometimes make decisions relating to fertility--about whether to try to have another child, whether to use or not to use a particular method of contraception and so on--is not difficult to show. Whether decisions are always made, or are even made in the majority of cases, is much more difficult to establish. Perhaps many couples have a child when they do not intend to, engage in sex without thinking through the consequences, or raise a family without ever considering any alternative. A first task for any decisional approach to fertility is to deal with such non-decisions.

Different theories accomplish this in different ways. One approach is to avoid the issue entirely. A theory might be said to represent not the way decisions are actually made but, in some limited or analogous fashion, the factors that enter into the decisions; then it might be argued that decisions take place as if the postulates of the theory held. The qualification might also be added that, though most people behave as if the theory held, not everyone need do so. This approach is sometimes used in arguments for micro-economic fertility theory (e.g., Ben-Porath, 1974). The decision process is treated as an undecipherable "black box", but the inputs it receives and the outcomes of the process are nevertheless modelled. Although this approach allows some important analysis of decision factors to proceed, it draws the veil over other important elements.

A second approach is to distinguish situations in which decisions are made from those in which no decisions are made. For instance, it may be argued that no decisions are made in pre-transition settings (e.g., Bourgeois-Pichat, 1967), or in settings where the couples are limited biologically to have fewer children survive than they would desire (Easterlin, 1978), or for any couple at low parities before some minimum number of children has been achieved (Fawcett and others, 1972). It is usually argued, in these treatments, that movement from a non-decisional to a decisional situation takes place, either with socio-economic development or with rising parities. This movement is associated with the relaxation of societal and group controls over reproduction and with an increase in the scope for personal control.

A third approach is to directly incorporate the non-decisions into the theory as a special class of decisions. They may be called passive decisions (as in Miller and Godwin, 1977), inertial or routinized decisions (as in Leibenstein, 1981), coerced decisions (Hollerbach, 1980), or something similar, and it is recognized that such decisions do not involve the same degree of consideration and reflection that enters other decisions. Putting such decisions on the same plane as other decisions makes the point that there are different ways to make fertility choices. The concept of a decision is somewhat broadened and loosened to include behaviour that is not fully deliberate or may not be entirely self-determined. However, the approach has the virtue of greater flexibility: for instance, any particular decision can be seen as a combination of active and passive elements, and any couple can be seen as moving from one to another type of decision and back again depending on specific circumstances.

Simplifying decisions

A third problem faced by decisional approaches is to reduce the complexity of actual decisions to a few key elements or dimensions that can be studied. Depth interviews and participant observation indicate the messiness of actual decision processes, the great variety of events, perceived

consequences, desires and preferences, capabilities, information inputs, and social influences that affect choice, and the unpredictable order in which these enter the process. Consider this interview respondent, for example:

"My husband and I don't talk too much ;about family planning_. Sometimes he says we have too damm many and I say, Yeah, and that is that. I told him Mom was taking me to the doctor and I don't know what he thought about it. I brought the diaphragm home and showed it to him. It didn't work; I think I'm pregnant now. I used it some of the time but not that one night. I went to bed early and by the time I was enough awake to know what was happening it was all over. I asked him to stop; I told him I didn't have my diaphragm on, but he acted like he couldn't hear. My husband tried rubbers but he says he's too big and they hurt him real bad. ;Who should have the main responsibility for contraception?_ The wife. She has to have the kids, so she won't forget. The husband should help. though, by not doing anything without asking the wife about whether she's got it in". (Rainwater, 1960:20).

This quotation suggests disjunction between decisions on family size and on contraceptive use, the sequential trial of different methods, some amount of influence from relatives and possibly medical professionals, different levels of communication and an awkward division of responsibility between spouses, and it points to a number of considerations in decisions, including concern about child-rearing burdens and the desire for sexual satisfaction for the man. Since a single quotation is unlikely to tell the whole story, the actual decision process in this case may be still more complex.

Given the tangle of elements in such decisions, researchers necessarily deal selectively with particular aspects. The typical approach is to consider only one decision, on one topic, at one point in time, using one decision rule, by one decision-maker. These different ways of simplifying the problem may now be considered. First, the focus on either reasons or decision rules will be considered, and then the simplification of the decision problem in relation to time and its simplification in relation to the number of decision-makers.

Reasons versus rules. One way to simplify the problem is to focus either on the considerations that enter a decision or on the way these are combined in making choices. The first approach is more common. A major aim of much Knowledge-Attitude-Practice (KAP) research, for instance, is to identify the reasons underlying usage and choice in contraception. In somewhat similar fashion, some micro-economic work on fertility is concerned with ascertaining the actual monetary costs and returns from children which influence childbearing decisions. Psychosocial research on the value of children is parallel to this in trying to elicit the perceived benefits and costs of having children, whether economic or non-economic. In each of these examples, there is at best limited concern with the way individuals or couples integrate different motives and arguments. A simple rule, like utility maximization, might be assumed, but it is generally not investigated in any

depth. If models of this sort fail to predict decision outcomes, the researchers typically search for other reasons behind the decision or other ways to assess the factors that enter them rather than looking for alternative ways of combining them.

The opposite perspective of focusing on rules for combining different considerations has been largely the province of social psychologists. Work on subjective expected utility (Townes and others, 1977) and the expectancy x value theory (Fishbein, 1972; Jaccard and Davidson, 1976) has been mainly concerned with testing the appropriateness of hypothesized decision rules, with much less attention to the substantive reasons or motivations that the rules are used to combine.

These approaches generally involve only one hypothesized rule that everyone is assumed to follow. Leibenstein (1981) suggests instead a hierarchy of different rules, with the simpler ones chosen over the more complex ones when the costs of the decision procedure are too great. It is of course also possible that different people consistently follow distinctive rules, but work on this possibility has barely begun (Nickerson and others, 1981).

The time dimension. Besides limiting attention to specific outcomes and to either reasons or rules, the task of theories of fertility decisions are usually simplified by assuming that decisions take place at a single point in time, and do not undergo repetition, reinforcement or reconsideration. An analysis of economic reasons for childbearing decisions, for instance, may take measures of economic factors or proxies for them and assume that the decision-makers hold these quantities in their heads simultaneously and make decisions based on them at one point in time. Psychological theories about decision rules, similarly, often assume that the rules are applied once for a given decision and do not allow for alteration of the decision based on changes in perceptions about and attitudes towards its consequences.

Attempts to treat fertility decisions as involving changing elements over time (e.g., Hass, 1974; Namboodiri, 1972) may appear more phenomenologically apt, but they often suffer from various drawbacks. They introduce considerable complexity into theoretical decision models, and perhaps as a consequence typically lack sufficient specification of the relevant factors or of how they work. These sequential models often serve as little more than classificatory schemes calling attention to particular types of changing variables but not specifying their relative importance and the way they interact to affect fertility.

The decision-maker. As with the time dimension, a decision theory can be much simplified by concentrating only on one decision-maker. Whether this decision-maker is the wife, the husband, the family patriarch, the husband's mother or the whole household considered as a single entity should not affect the basic structure of a decision theory. What should make a difference and complicate the analysis is involving more than one person in a decision. Then the relative influence of the participants and the bargaining between them would have to be taken into account.

One attempt to do this is Bagozzi and Van Loo's (1978) model, which builds in social exchange among family members as a central part of fertility decisions. More typically, however, fertility research either glosses over the question of who makes fertility decisions, or it focuses on the interaction between spouses without integrating this with the other concerns that animate fertility decisions.

Decisions and the outcomes of behaviour

A final problem to consider in studying fertility decisions is the fact that, by themselves, even the most carefully considered decisions do not fully determine subsequent fertility. Contingencies like unexpected higher or lower fecundity and unanticipated contraceptive failures must also be taken into account. A decision approach may ignore such possibilities, essentially assigning them to random error, or may attempt to build them into the theory somehow. For instance, they may be built in as additional contingencies that determine behavioural outcomes subsequent to the decision, in effect adding a further step to the decision sequence.

CONTENT AND PROCESS

This discussion suggests a useful distinction between decision content and decision process. Content covers the reasons underlying a decision, the perceptions, attitudes and expectation that determine choice. Content is not strictly rational; it includes emotional reactions to and even imagined consequences of behaviour. Process includes several things: the rules that determine how content is evaluated; the procedures or action sequences involved in making a choice; and the interactions and bargaining leading up to a choice when more than one person is involved. Under process one may also include the execution of decisions and the handling of decision failures. Thus, content answers the questions why a decision was made; process answers the question how it was made, and may also be extended to include the question of how it was implemented.

The distinction between content and process, though usually easy to draw, is not absolute. For instance, the need to communicate with the spouse may be a consideration in not using contraception, and it is therefore a part of the decision content, though such communication would itself be part of the decision process. Nor is it implied that content and process are necessarily independent. Process can shape the reasons for a decision, as when surreptitious decisions on contraception or abortion are made by the wife that automatically exclude all the husband's reasons. Similarly, content can dictate process, as when a strong aversion to contraception may preclude an extended consideration of its costs and benefits.

In addition to making this distinction, it is useful not to separate decisions on childbearing and decisions on fertility regulation. As argued earlier, these are not two distinct types of decisions but rather they are interdependent: childbearing decisions require fertility regulation decisions to enforce them, and fertility regulation decisions necessarily affect childbearing outcomes. Furthermore, as in several other approaches, non-decisions will be treated as a special class of decisions, involving some of the same considerations that enter other decisions, but some distinctive considerations as well.

THE CONTENT OF FERTILITY DECISIONS

For a factor to be part of the content of fertility decisions, the decision-makers must, at some stage in their consideration, reflect on this factor, and levels of the factor must ultimately make some difference. These two requirements may dictate different approaches to studying content. Since content is necessarily perceptual, or must be perceived, the most direct way to determine it is to ask the decision-makers. However, individuals seldom have sufficient perspective on their own decisions to know how the content differs from that for other people. Thus, study of the objective correlates of perceptions, attitudes and evaluations is considered by some to provide a safer and more reliable guide to content.

It is convenient therefore to represent content as involving a hierarchy of factors, as in figure I. At the most immediate level, content involves perceptions, attitudes and similar psychic phenomena.

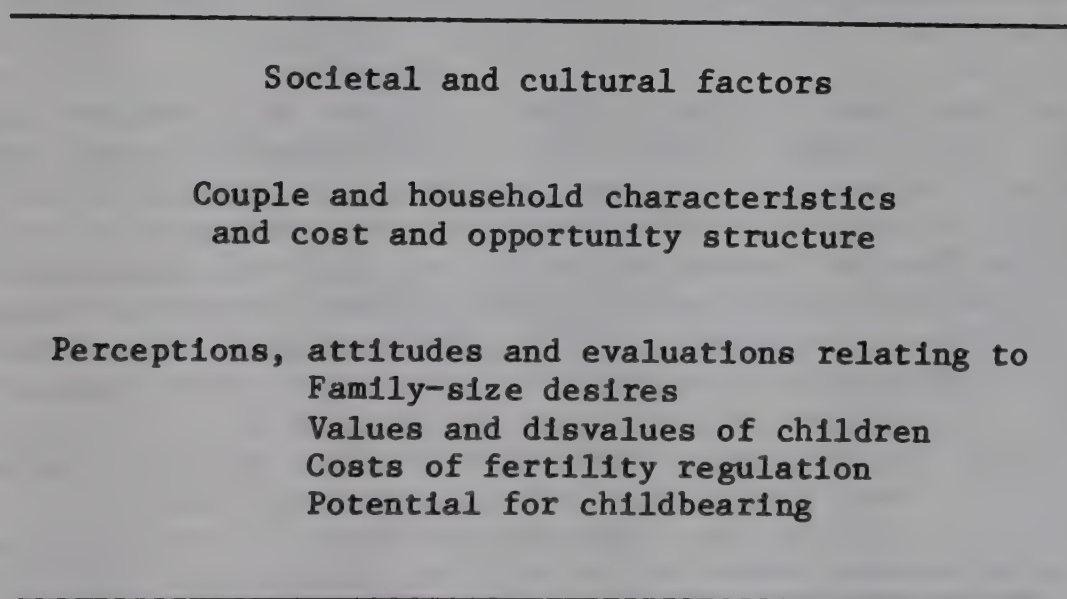


Figure I. Levels of content in fertility decisions.

Affecting such perceptions is the couple's objective social reality, including personal and household characteristics and the structure of the costs and opportunities they confront. Still farther removed are the determinants of this objective individual reality, including institutional, societal and cultural influences.

Three major sets of perceptual or attitudinal elements that, it will be argued, constitute immediate decision content have been studied: family-size desires, values and disvalues of children, and the perceptions of and reactions to regulation methods, which are discussed here under the rubric of subjective costs of fertility regulation. A fourth set, somewhat less studied but also of some apparent importance, covers perceived potential for childbearing. In addition, some argument has occasionally been made that social norms are the dominant factor in fertility differentials; since norms have a perceptual side, they will be considered as a possible content factor.

Family-size desires

Family-size desires have typically been measured through survey questions about how many children respondents want. The two major types of questions are (a) how many children respondents would want if they were starting their marriage again (which may be labelled "starting-over" measures or simply ideal family size) and (b) how many additional children they want, which when combined with the number of living children provides what will be called the "desired family-size" measure.²⁷ The many variations in the possible wording of these two types of questions often involve hypothetical differences that respondents are supposed to consider in their judgements. Some questions, however, concern not the personal desires of the respondent but rather perceptions of or prescriptions for others, such as perceptions of the typical family or recommendations for a daughter. Such questions are somewhat more relevant to the later discussion of norms.

To establish that family-size desires are part of decision content, it must be shown, first, that individuals do formulate some ideas about family-size desires; second, that these desires enter consideration prior to the actual decision and are not after-the-fact rationalizations for fertility behaviour; and, third, that variation in desires does produce some variation in fertility. These questions have been debated for some time; recent papers by McClelland (1982) and Pullum (1982) provide useful summaries of the arguments and the evidence, and they will be drawn on in this discussion.

That individuals do formulate family-size desires seems indicated by the fact that most survey respondents can provide numerical answers to questions on ideal and desired family size (McClelland, 1982). There are exceptions, however, particularly cases where respondents say that the number of children they will have is up to fate, chance or God--though many of these respondents are able to reply if asked a subsequent question about the number they hope God will send (Ware, 1974). The proportion of cases unable or unwilling to

give a numerical answer is small in the majority of surveys in developing countries, though in a few studies the numbers have been substantial (e.g., Farooq and others, 1977). Family-size desires, therefore, do seem sufficiently formulated to play a part in decisions in the majority of cases; the exceptions probably involve cases where other content elements are sufficiently important to make family-size desires irrelevant.

Such desires are often formulated prior to decisions, as research into fertility preferences among children and youth indicates. Pohlman and Rao (1969), for instance, found that Indian school-children could provide estimates of large and small families and had preferences between the two which varied systematically by such factors as grade, residence and number of siblings (see also Kee, 1981). Westoff and Potvin (1966) have hypothesized that preferred family-size ranges are internalized by American girls in childhood and early adolescence (around eight to thirteen years). Concepts of fertility preferences are therefore developed before fertility decisions have to be made.

It may be argued, however, that these preferences are not firmly based and are readily changed by actual childbearing experience. To some degree, individuals adjust their ideal numbers to allow for the number of children they actually have (e.g., Knodel and Prachuabmoh, 1973; Pullum, 1980). Rationalization is never complete, however; substantial numbers of unwanted children are often reported (CELADE and CFSC, 1972; Westoff, 1981a), and the majority of respondents prefer a family size different from their own. In addition, the second type of measure, that of desired family size, could be said to be based on rationalization only if all respondents wanted no more children, which is clearly not the case.

The question of whether family-size desires relate to actual fertility is linked to this one, since research showing a relationship with subsequent behaviour would make it less likely that these desires were purely rationalizations. Longitudinal studies seem to show that family-size desires do foretell subsequent fertility behaviour (McClelland, 1982), whether over a 20-year span (Westoff and others, 1957) or over a short span of two to five years (e.g., Freedman and others, 1975; Westoff and Ryder, 1977; Nair and Chow, 1980). The possible complications in such predictions are somewhat different for the longer-term and shorter-term studies. In the longer term, changes in couples' fertility preferences cannot be excluded; in the short term, on the other hand, preferences are less likely to change, but transitory changes in economic conditions may lead to postponements of births. For such reasons, and because of the other elements of decision content still to be considered, family-size desires do not predict childbearing perfectly (see, e.g., Westoff, 1981b).

Assuming then that family-size desires represent an important element of decision content, it may be noted that ideal family size and desired family size reflect only one aspect of such desires. Decisions necessarily involve alternative choices, and these two measures indicate only which family size is most favoured, without providing information about how alternative sizes are

evaluated. Rankings of alternative outcomes are provided by the ordering questions introduced by Coombs and others (1975), though these measures are available in fewer studies than ideal and desired family size. A more thorough system of evaluating alternative outcomes is suggested in Terhune and Kaufman's (1973) discussion of the family-size utility function. Terhune and Kaufman, as well as Coombs and others, argue that focusing on the single most favoured family size misses important information: looking at the entire range of evaluations instead would allow one to predict, for instance, that, if the evaluation of the most preferred family size was in fact only slightly above the evaluation of the next higher size, there would be a substantial possibility of having one extra child. Even uncertainty about family-size desires carries important information that analysts often overlook (Morgan, 1981). There are in addition many other dimensions of family-size desires that might also be considered, including the desire to have a child or not to have a child within a specific period, preferences regarding timing of births and preferences for sons or daughters.

Other than fertility behaviour itself, there are no objective correlates of family-size desires to consider. The roots of family-size desires may lie in other elements of decision content, specifically in fertility norms and in values and disvalues of children, which will be discussed next.

Values and disvalues of children

Like family-size desires, values or benefits of having children and disvalues or costs of having them have been studied through survey questions to get at personal perceptions. Related work has involved observations and measurements of children's roles and contributions, but, because this work does not concern decision-makers' perceptions, it is not considered here as getting at immediate content.

Several different classifications for values and disvalues of children have been offered. Hoffman and Hoffman (1973), for instance, provide a motive-based classification of values that has been influential in later work. Table 1 provides a different classification of values as well as disvalues, based on surveys of the value of children in several countries (Arnold and others, 1975; Bulatao, 1979). Three major categories of values are distinguished. Instrumental assistance values cover all the uses to which children can be put, such as helping in the house, providing security for old age, carrying on the family name and providing certification of one's adult status. Rewarding interactions values include non-utilitarian gains from interacting with children, such as the companionship, love and distraction from work they provide. Psychological appreciation values, finally, cover the psychological impact of children on parents, and the way children can be used to satisfy such motives as achievement and power. The four major categories of disvalues are: (a) the financial costs; (b) child-rearing demands, such as the added work and worry; (c) restrictions on parents, such as interference with the wife's employment as well as with the couple's social activities; and (d) costs imposed on social relationships, including marital strain and over-population.

The specific values and disvalues under these general headings are not of equal importance. Some are mentioned very frequently in surveys across countries, others hardly at all; some show great variation across settings, others are mentioned about equally often everywhere. The values important in fertility decisions will be considered below. It is necessary first to consider whether values and disvalues constitute reasons for fertility choices or post-hoc justifications for them.

The majority of respondents can identify particular values and disvalues attached to children in response to open-ended questions. In all but one of the nine country samples reported in Bulatao (1979), only between 0 and 3 per cent of respondents did not cite any advantage to having children; somewhat larger numbers did not cite any disadvantage, claiming, often, that there were none. Like family-size desires, values and disvalues develop in childhood and adolescence. Perceptions of values and disvalues have been elicited from children in several countries using open-ended questions, structured questions and sentence completions (see Kee, 1981, for a review). The values cited often parallel those of parents and vary across social categories as parents' values do (Rothenberg and Philliber, 1979); they also seem to become clearer with age.

Table 1. Values and disvalues attached to children

<u>Values</u>	<u>Disvalues</u>
Instrumental assistance	Financial costs
Help in housework	Cost of education
Help in old age	Other financial costs
Financial, practical help	
Family name, line	Child-rearing demands
Religious, social obligations	More work
Adult status, social norms	Emotional strain
	Health, pregnancy
Rewarding interactions	Discipline
Companionship, love	Child's sickness
Happiness	Worry over child's future
Play, fun, distraction	Other child-rearing problems
Marital bond	
	Restrictions on parents
Psychological appreciation	Tied down
Living through children	Can't work
Achievement, power	
Character, responsibility	Costs to social relationships
Incentive to succeed	Marital strains
Fulfilment	Over-population

Source: Bulatao, On the Nature of the Transition in the Value of Children, Paper No. 60-A (Honolulu, East-West Population Institute, 1979).

Consistency between values attached to children and their objective worth would reinforce the argument that these values are not simply parents' rationalizations. This consistency has not been investigated systematically, but variations in values and disvalues across social categories generally turn out as expected. For instance, parents in rural settings, where households can better utilize child labour, emphasize the economic contributions that children make more than urban parents, who in turn place more stress on the opportunity costs of having children (Fawcett, 1982).

Longitudinal evidence that values precede fertility choices is very limited. In studying subjective expected utility as a decision rule in the United States of America, Townes and others (1977) developed a value hierarchy and tested its effect longitudinally. Though the authors' emphasis was on the rule rather than the values, values did have significant effect on whether a woman became pregnant (see also Davidson and Jaccard, 1979). Limited evidence of this type suggests that values are not entirely rationalizations. So many values are typically involved in a decision, however, that some degree of rationalization, particularly of less important values, is certainly possible (Terhune, 1974).

A more difficult question than the temporal ordering between values and choice is the ordering between values and family-size desires, since both of these are intra-mental phenomena. The most likely case is that each one affects the other: family-size desires are formed on the basis of values, which are adjusted to be consistent with family-size desires. Indirect evidence for this has been suggested from the effect of number of children on both family-size desires and values. Individuals with more children desire fewer additional children and give lower ratings to particular values related to desired family size. Neither the relationship to the additional children wanted nor the relationship to values is entirely mediated by the other variable. (Bulatao, 1975:158).

Which values and disvalues are more important in decision content varies from one setting to another, and also varies by birth order. Cross-sectional research linking values to fertility has used many different measures and approaches, and results are seldom comparable. Nevertheless, the links between values and fertility have been summarized in this manner:

(a) Expectations for economic benefits from children are associated with high fertility; the same is true for other instrumental satisfactions having to do with continuity of the family and traditional role relationships;

(b) Psychosocial satisfactions--the categories labeled "rewarding interactions" and "psychological appreciation" in ;table 1_u tend to be associated with low fertility;

(c) Perceptions of financial costs do not have a clear or consistent impact on fertility;

(d) Perceived restrictions on parents, including work-related opportunity costs, have a relatively weak negative effect on fertility;

(e) The perceived demands of child-rearing, such as emotional strain and physical work, do not usually have a significant effect on fertility (Fawcett, 1982).

The other values and disvalues mentioned in table 1, such as religious obligations, the marital bond and over-population, have only minimal impact.

Objective, non-perceptual measures of these values and disvalues have been obtained only with respect to the economic contributions and costs (including the time costs) of children. Recent studies have provided a picture of how children use their time and of what they consume in scattered villages in developing countries, mainly in Asia (e.g., Binswanger and others, 1980). More elaborate economic work has been concerned with assessing actual and relative costs of children in the United States (Espenshade, 1977; Lindert, 1978). Work in this area typically takes for granted the importance of economic costs and benefits, paying minimal attention to relating the measures obtained to fertility or to family-size desires.

More often an issue in this work is whether children make a net economic contribution or not. Caldwell (1976) takes a firm stand in the affirmative, with reference to pre-transition settings: children do make a net economic contribution to the chief fertility decision-makers, whom he identifies as the family elders. Various assessments of the empirical evidence (Mueller, 1976; Cain, 1982; Lee and Bulatao, 1982) suggest, on the other hand, that children's net contribution is almost always negative. However, such calculations require the assumption that well-developed markets and efficient institutions exist to replace such child services as insurance against economic risk (Lee and Bulatao, 1982). Perceptual data are generally not available on the net cost question, although Lee and Bulatao (1982) cite Nigerian survey findings that seem to reinforce the conclusion that children are typically a net cost to their parents in developing countries.

Another issue raised in this work is how net benefit or cost, or specific components of it, varies by household characteristics or social setting. Regardless of whether children are a net asset or a net drain, variations in their net economic value could have important implications for fertility differentials. As Lee and Bulatao (1982) summarize the literature, children become increasingly costly investments for parents in the course of socio-economic development: their potential economic contributions fall off sharply, their costs rise in monetary terms, and the time costs of child-rearing become increasingly heavy.

Subjective costs of fertility regulation

The subjective costs of fertility regulation (which includes, in this discussion, contraception and induced abortion) ^{3/} have not been studied as systematically as family-size desires and values and disvalues of children. Family planning research has generally not used this concept, which was introduced by Easterlin (1975) to integrate the treatment of fertility regulation into a general quasi-economic framework for fertility. Nevertheless, family planning research provides information about many aspects of perceptions and attitudes towards contraception that can be considered

under regulation costs: knowledge about and attitudes towards family planning, perceptions of contraceptive availability, reasons for not using family planning or for discontinuing it, reasons for choosing one contraceptive over another and so on.

Given the diversity of this information, a crucial first task is to provide some comprehensive classification of regulation costs. Two previous treatments related to costs suggest important distinctions to make. Freedman and Berelson (1976) distinguish two general criteria for evaluating contraceptives: their intrinsic qualities, specifically their medical safety, effectiveness and continuity; and their social acceptability, with reference to personal, cultural, religious, sexual, medical, organizational and logistic, economic, political and philosophical factors. Bogue provides a fairly elaborate list of 16 different psychic or normative contraceptive costs under six general headings:

- (a) Contraception as a threat to cultural values and norms;
- (b) Contraception as a challenge to social institutions and group values and norms;
- (c) Contraception as foregoing perceived benefits of childbearing;
- (d) Contraception as behaviour inconsistent with personal values and norms;
- (e) Anxiety costs of practicing contraception;
- (f) Psychologistics: perceived availability of contraceptive services (Bogue, 1982).

These two classifications suggest important distinctions that are incorporated into the schema in table 2.

Table 2. A classification of the costs of fertility regulation

<u>Costs of access</u>		<u>Costs of use</u>	
<u>Economic and health costs</u>	Costs of travel to source (availability)	Monetary costs of devices, services	<u>Health risks</u> Mortality Morbidity
<u>Psycho-social costs</u>	Information costs	Perceived barriers to obtaining services (perceived availability)	<u>Costs related to method attributes</u> Perceived side effects Uncertain effectiveness Inconvenience of use Other method attributes (route of administration, duration of action, reversibility)
<u>Costs of fertility regulation as proscribed behaviour</u>			
Violation of personal beliefs			
Marital problems			
Social and religious disapproval			

This table includes both objective economic and health costs and subjective psychosocial costs, following a distinction by Easterlin (1978). 4/ Though the focus here is on the psychosocial costs, there is some parallelism to be noted between objective and subjective costs: the monetary costs of traveling to a contraceptive source and purchasing devices and services are paralleled by the subjective costs of obtaining access, 5/ and the objective health costs by perceived health risks. Not included in this table are costs that the couple would incur from having fewer children as a result of practicing family planning (Bogue's third category above), since these costs involve lost values that are already covered in table 1. Costs are listed from left to right roughly in the order in which they would be incurred by someone using contraception. Thus, costs of access are distinguished from costs of use. The psychosocial costs will be considered in this order.

Information costs have not been studied directly, but some idea of what these involve can be obtained from data on knowledge about contraception. Most ever-married women in 20 studies in the WFS had heard of some method of birth control, and most of them had heard specifically of at least one modern method (United Nations, 1981). It might be inferred from this that information is readily available and information costs therefore quite low,

though various countries of sub-Saharan Africa, Nepal, and more remote regions in other countries may be exceptions (Lightbourne and others, 1982). This is, of course, a fairly recent development: before the development of modern contraceptives and the establishment of large family planning programmes, information costs were undoubtedly much higher and possibly prohibitive in many areas. Information is less readily available for specific contraceptives, however, so that women who want to use methods with particular characteristics may still bear high information costs. Finding out about specific sources of contraceptive supply could arguably be considered under information costs, but instead they are treated here as an aspect of perceived barriers to obtaining services.

By comparison with knowledge of contraception, knowledge of family planning outlets is somewhat less widely available. One summary of WFS data gives the number of currently married women knowing of some outlet as ranging from 27 to 92 per cent across 12 countries (Lightbourne and others, 1982:37). Knowledge of a source is not enough to remove all perceived barriers, of course: the source may be too far away, too difficult to reach, too limited in the contraceptive services it provides, or inconvenient in some other respect (Lewis and Novak, 1982). Work on perceived availability of contraceptives has focused on perceived time of travel to the nearest outlet, but other access problems may also be important. Access to abortion almost always presents greater problems than access to contraception. Perceived availability does not always correspond directly to actual availability: Lewis and Novak (1982) suggest, for instance, that familiarity with the source and its greater attractiveness could reduce estimates of distance to it.

Following Freedman and Berelson (1976), a general category of costs is distinguished having to do with method attributes. These affect choice among contraceptive methods and also decisions on the use or non-use of contraception and on the continuation or discontinuation of use. Three main attributes are listed as affecting costs: the perceived side effects of a method, its uncertain effectiveness and its inconvenience of use, which may include both the amount of effort it requires and its effect on sexual pleasure. A general category of other attributes of methods is added, including route of administration, duration of action and reversibility. Effects on health, both temporary (such as alterations in menstrual bleeding patterns) and long-term (such as the risks of stroke or heart attack from pill use), are frequently cited as a major reason for concern about contraception. Concerns attach to all methods except the condom (Folch-Lyon and others, 1981), though the specific fears vary. In developing countries, these fears are often disproportionate to the actual health risks (Bogue, 1982; Schearer, 1982). Methods effectiveness is a major reason for choosing a particular method. In a four-country study comparing IUDs, pills and injections, effectiveness was the most important reason given for choosing the IUD, which was chosen by most subjects overall (World Health Organization, 1980). If other less effective methods had been included, effectiveness would presumably have been an even more important criterion. The same study showed that convenience of use was another important criterion, though this may be more significant in regard to method choice rather than the use or non-use of contraception.

The final category of costs is probably the most complex, and in fact takes up half of Bogue's set of categories. These are the costs that attach to fertility regulation as proscribed behaviour, or simply proscription costs. These costs apply from the first steps of obtaining access to the last stages of use, and possibly even after use has ceased. The degree of proscription varies, of course, from setting to setting and from method to method, as may the reasons behind proscription. The fact of proscription, however, of itself has important implications that the individual must consider in decisions. It may generate feelings of personal guilt or shame, create discord in a marriage and subject the user to negative cultural sanctions and the disapproval of others. These consequences are distinguished as three specific costs: violation of personal beliefs, marital problems and social and religious disapproval. Particularly when the proscription stems from a single widely shared system of beliefs and values, all three costs may be incurred simultaneously by someone practicing regulation, though they will probably not be equally important.

The first cost involves the feeling that fertility regulation violates one's conscience. The most basic instance of this is probably when one feels that attempting to control reproduction, as opposed to accepting whatever may come, is somehow not right. This belief is sometimes reported in studies of peasant communities, and may be linked to a more basic sense of fatalism about one's life. One may also feel guilt, however, out of a sense that the specific method at issue is morally wrong, as many people feel about abortion. Such costs should not be exaggerated, however: David (1982) reports that feelings of guilt after abortion are common but transitory, often overwhelmed by feelings of relief. The second cost, marital problems, attaches to regulation for at least two reasons: because regulation often requires, or at least is more reliable with, co-operation between the spouses, and also because its use can be seen as an element in the power dynamics in the dyad. The need to obtain the spouse's approval, and the difficulties one expects in discussing contraception with one's spouse, are part of this cost (Bogue, 1982). Contraceptive use may threaten the husband's authority or masculinity (Keller, 1970), adding to this cost. The third cost includes social disapproval, which can have a strong effect on rejection of contraception where relatively few are practicing it. As the number of adopters increases, this cost naturally declines. Religious prohibitions are also part of this cost, but apparently have less force by themselves.

As in the previous two sections, it may be asked whether subjective costs can be shown to be more than rationalizations for decisions taken on other grounds. The evidence on this is uneven: some costs are unlikely to be purely rationalizations, others might possibly be. Perceived availability does seem to be slightly modified by use (Lewis and Novak, 1982), but it appears unlikely that, at the individual level, all the influence would flow in that direction. Subjective indicators used by Rodriguez (1978), for instance, are consistent with actual levels of availability across countries and across urban and rural areas. With regard to method attributes, it is difficult to make a case that effectiveness or ineffectiveness is entirely a rationalization. However, perceived side effects may well be symptoms of

deep-seated guilt, particularly since they often do not correspond to the actual health risks (Schearer, 1982). The last set of costs, based on the proscription of fertility regulation, similarly includes some that might be rationalizations, such as the violation of personal beliefs; others, however, such as religious disapproval, can be verified from statements of religious leaders, and therefore may have some objective content.

Similarly, the evidence on the relative importance of specific costs and their actual influence on fertility decisions is spotty and sometimes inconclusive. More recent work has been done on availability costs than on the other costs, with generally firmer results. Differences in contraceptive use are marked between those who know of an outlet and those who do not, even when desire for another child is controlled. However, among those who do, perceived travel time to an outlet relates to contraceptive use mainly in those areas where actual availability is still relatively low (Rodriguez, 1978; see also Brackett, 1981). Actual availability, in addition, clearly relates to contraceptive use (Tsui and others, 1981).

Of the costs related to method attributes, fear of side effects has frequently been cited as a major reason, if not the major reason, for the non-use of contraception (Bogue, 1982). Actual health risks have an effect on method choice in developed countries, but fears, often unjustified, are much more significant in developing countries (Schearer, 1982). Similarly, method effectiveness and convenience are often cited by respondents as reasons for method choice (as in World Health Organization, 1980). However, attempts to predict contraceptive use or method choice from indicators of concerns with such method attributes have generally not been made.

The importance of the proscription costs has been noted by Bogue (1982), who considers the need for inner control, the burden of communication and social disapproval among the major costs with greatest impact (together with method side effects). The effects of the proscription costs have been studied in many different ways, with some interesting and many uneven results. For instance, those who lack personal efficacy may be considered more likely to violate personal beliefs in attempting to control their fertility. Efficacy, as measured by attitude scales, has been studied in its relation to contraceptive use, with some confirmatory findings (e.g., Sinquefield, 1974), though other results are more equivocal (e.g., Bulatao, 1975). The marital costs have been investigated by testing the relationship of marital communication to contraceptive use, with results that generally support the importance of this cost ((Beckman, 1982). Evidence on the importance of social disapproval as a cost may be gleaned from studies that show that social support is an important factor in contraceptive behaviour (e.g., Kar and Talbot, 1980; see Beckman, 1982). In some of this research, the subjective cost has not been measured directly, but the evidence linking fertility or contraceptive use to objective measures related to the subjective cost does serve to reinforce the argument that the subjective costs are not mere rationalizations.

Perceived potential for childbearing

In attempting to explain their non-use of contraception, survey respondents often said that there was little or no chance that they would get pregnant. For instance, of currently married non-users in the Korean Contraceptive Prevalence Survey (Koh and others, 1980), 22 per cent said they had recently had a child, 19 per cent claimed they were menopausal, and 3 per cent said they had no husband present. Similarly, of non-users in the Mexican Contraceptive Prevalence Survey (Westinghouse Health Systems and Coordinación del Programa Nacional de Planificación Familiar, 1978)—which included unmarried women—38 per cent said they had never been sexually active and 9 per cent were not currently active. Among non-users who were currently active sexually, 23 per cent reported they were sterile or menopausal and 7 per cent had recently given birth or were nursing. Since perceptions like these of a reduced or absent potential for childbearing seem to explain fairly large proportions of non-use and are awkward to include under any of the previous content factors, they are considered here as a separate content class.

Shedlin and Hollerbach (1981) treat these matters under "perceived susceptibility to conception", which depends not only on actual events like a previous birth, breast-feeding and sexual intercourse but also on the individual's understanding of the reproductive process. Such perceptions of susceptibility are not necessarily veridical. Infecundity, for instance, appears to be underestimated in reports from married women (Hollerbach, 1982, citing Nortman, 1982), but unmarried teenagers, on the other hand, sometimes underestimate the risk of pregnancy (Zelnik and Kantner, 1979). Shedlin and Hollerbach (1981) suggest that married women's perceptions of their susceptibility to conception are primarily based on their own previous experience, particularly the spacing between their previous pregnancies and the number they have had. They do not discuss perceptions relating to the probability of miscarriages and still births, though these should also affect potential childbearing.

From the perspective of the entire reproductive span, one might speak equivalently of the perceived "supply of children" (Easterlin, 1978), or the total number of surviving children a woman should reasonably expect, given patterns of breast-feeding, intercourse and related behaviours, if she makes no attempt to limit her childbearing. As with family-size desires, these perceptions may be said to include not only numbers of children or the probability of a birth, but also other related outcomes, such as the probability of having a son or daughter.

Despite the frequency with which perceptions of susceptibility or the supply of children turn up as important factors in the non-use of contraception, such perceptions have generally not been studied systematically. Cases in which such perceptions are important are often excluded in sampling or in analysis (e.g., if her husband is away or if she thinks she or her partner is sterile, a woman may be excluded), so that variations in these perceptions and their effects are not investigated. An

exception is Miller's (1981) study of a small sample of United States of America couples, which did attempt to measure "perceived conceptive capacity" and found it had some role in reproductive decisions.

An additional factor that may be considered under this heading is perceptions of the likelihood that a child will survive. In using the term "supply", Easterlin refers to surviving children rather than births, on the assumption that couple's fertility decisions are directed towards providing the former. Concern about infant and child mortality is in fact often cited in less developed countries as a reason for avoiding having an only child (Bulatao, 1979). In settings where child survival is still problematic, concerns about it may therefore influence fertility decisions.

Perceptions of the proportion of children in a community that will survive to a given age are reported to be quite accurate, at least when averaged within communities. In one Guatemalan village, for instance, the average perceived survival rate from birth to age 15 was 77 per cent, whereas the actual survival rate estimated from demographic data was 76 per cent (Pebley and others, 1979; also Heer and Wu, 1975, 1978). The effect of such perceptions on fertility is not clear: they appear to have affected subsequent fertility in Taiwan, Province of China (Heer and Wu, 1975, 1978), but not the desire for additional births in Guatemala (Pebley and others, 1979). More relevant than community-wide perceptions would be perceptions of the likelihood that one's own children would survive. Specific questions on this are very awkward to ask, however, and have apparently not been tried. Like perceptions of fecundity, such perceptions may depend largely on one's own experience with child mortality. Several studies show that having lost a child leads to higher subsequent fertility, though on the average the increase is not sufficient to make up for the loss (Heer, 1982). Perceptions may also depend on the experience of one's mother: Pebley and others (1979) find that the proportion of one's siblings who have died (up to what age is not clear) increases the desire for additional children.

Social norms

Social norms may be understood as widely shared rules about how people should behave in particular social situations, enforced by social disapproval and other similar social sanctions (Mason, 1982). Norms are said to contain prescriptions for many fertility-relevant attitudes and behaviours: family size, entry into sexual unions, abstinence and coital frequency, contraceptive use and other behaviours listed by Davis and Blake (1956) as "intermediate variables". Given the common sociological belief that much individual behaviour is in fact patterned by group or societal factors, norms have been treated in many cases as central in the determination of fertility (e.g., Freedman, 1975).

Theoretical development of the concept and empirical investigation of its nature and effects have lagged, however. Unambiguous evidence is difficult to provide even for the existence and impact of family-size norms, which are the ones most often discussed in the literature. The importance of the concept of norms may therefore be called into question (Mason, 1982).

Social influences on fertility are already reflected in the content elements that have been discussed. Under values of children, adult status and satisfying social norms were listed, and, under regulation costs, social and religious disapproval was included. For the present treatment, therefore, there appears to be no compelling necessity to include norms as a separate content element, through the possibility that they influence decisions through these and conceivably other elements previously discussed should be recognized.

Interrelations among content elements

The four main decision content elements covered are those about which some literature appears to exist. The major arguments related to having a larger or a smaller family and practicing or not practicing fertility regulation appear to have been included under one or another content element. It is possible to take many lists of fertility-related attitudes (such as the detailed list of "opinions, aspirations, concerns, and other feelings" related to family planning provided by Folch-Lyon and others, 1981) and classify most if not all of them under these content elements.

In addition, however, these content elements dovetail in a logical fashion. One way to represent their interrelationships is shown in figure II, a diagram developed by the Panel on Fertility Determinants (Bulatao and Lee, 1982a), following Easterlin (1978), to encompass all the factors affecting fertility. It is possible to see the diagram as representing the interrelationships of decision content and the impact of content on fertility. Family-size desires and values and disvalues of children both fall in the demand-for-children box in this diagram, with the latter mediating the effects of tastes and objective constraints on the former. Perceived potential for childbearing, including both susceptibility to conception and expectations for child survival, falls in the supply-of-children box. And the subjective costs of fertility regulation falls in the fertility regulation-costs box.

The comparison between demand and supply--or between family-size desires and the perceived potential for childbearing--determines "motivation to control fertility", or how badly the individual wants to avoid having a child. This motivation, in combination with regulation costs, determines whether fertility regulation will be used to limit family size. It is important to note that the motivation box in the diagram is not meant to represent any distinct content element. "Motivation" is nothing more, here, than the difference between demand and supply, and is represented separately only for convenience. Since family-size desires and perceived potential for

childbearing are both complex, including consideration of number and sex of children and timing and spacing of births, motivation is not determined by a simple subtraction but by a multidimensional comparison of two sets of perceptions and attitudes.

The diagram suggests a logical relationship between decisions on fertility and decisions on practicing fertility regulation: fertility desires are among the elements that enter decisions on fertility regulation, which, when carried out, affect actual family size. Fertility decisions can be defined, narrowly, as one element in regulation decisions or, broadly, to include regulation decisions as one of their elements. In either case, fertility is seen as determined not only by these decisions; as the arrow directly from supply of children to fertility indicates, behaviour and biology can have an effect on fertility that is not mediated by explicit consideration of fertility outcomes. If regulation is not practiced at all, for instance, these supply factors (natural fertility and child survival in combination) should entirely determine family size.

The diagram does not explicitly represent decisions on the use of contraception or induced abortion for spacing rather than terminating births. However, a closely parallel diagram can be used to represent content factors in spacing decisions (figure III). For convenience, the objective factors affecting content, represented in highly abbreviated fashion in figure II, are left out of figure III. Factors are interrelated in figure III in the same manner as in figure II, and the fertility effect in figure III is presumably one of the factors that explains the direct link from supply to fertility in figure II.

It is not being argued in these diagrams that, when making decisions, individuals in fact weigh and interrelate content elements in precisely this manner. The diagrams represent instead one logical way for arranging content elements; how they are actually dealt with in decision-making is the subject of the next section.

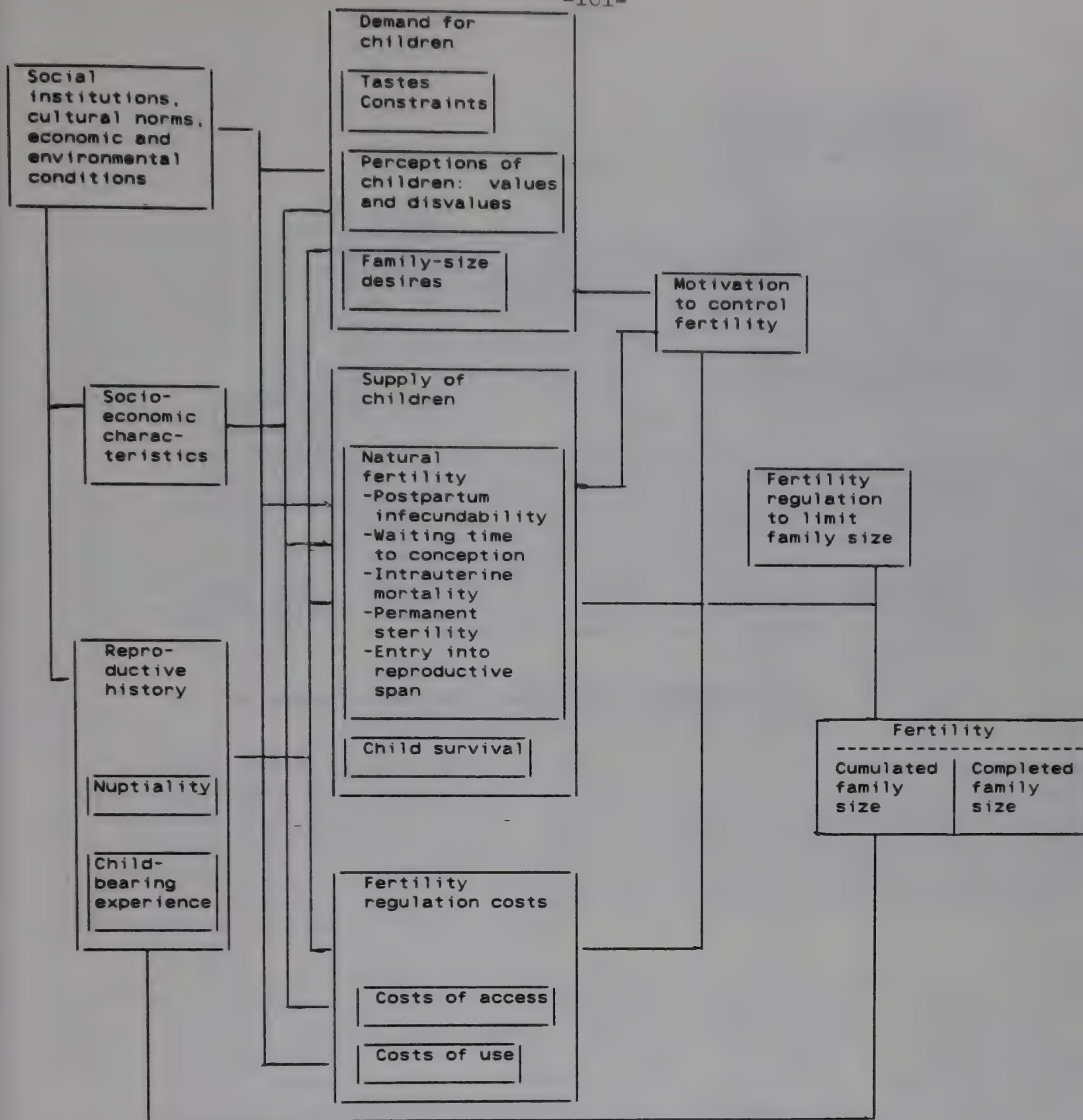


Figure II. A representation of the interrelationships among decision content factors and other factors affecting fertility

Source: Panel on Fertility Determinants, National Academy of Sciences, in Rodolpho A. Bulatao and Ronald D. Lee, *Determinants of Fertility in Developing Countries: A Summary of Knowledge* (Washington, D.C., National Academy Press, 1982).

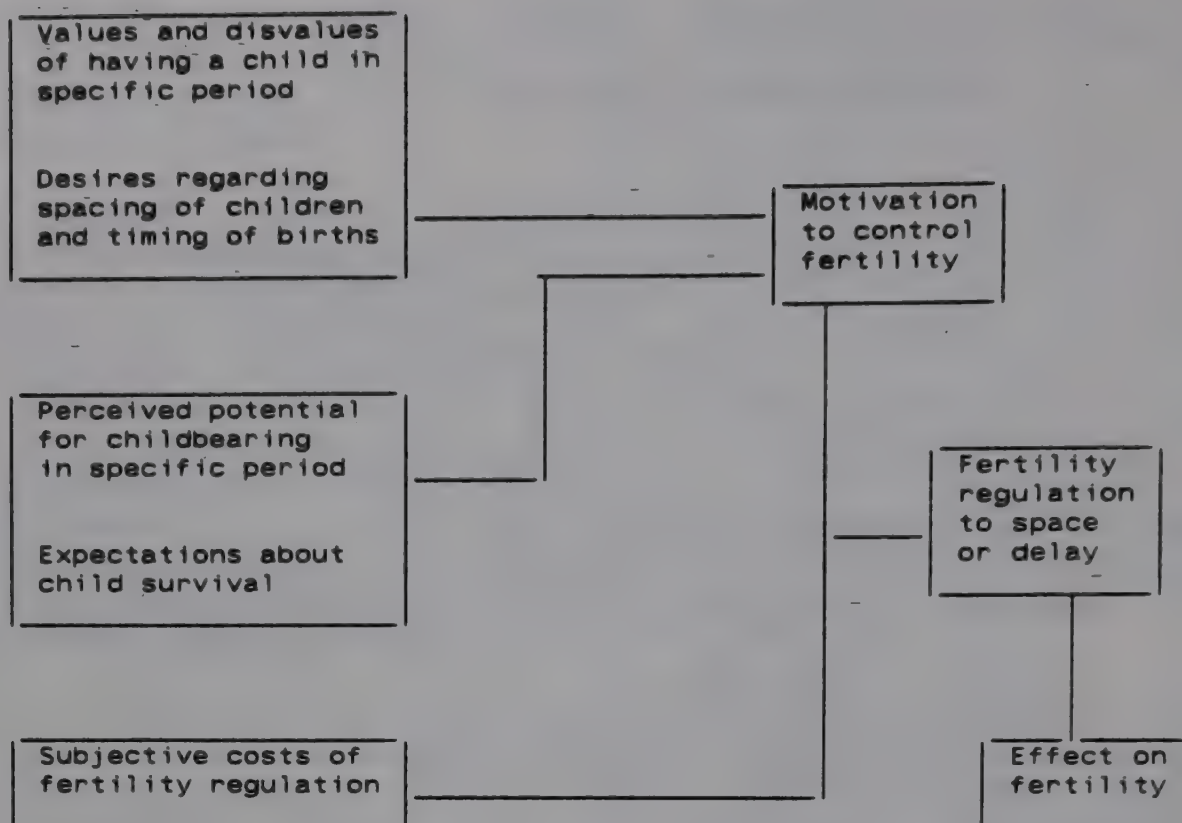


Figure III. A representation of the interrelationships among decision content factors affecting spacing behavior

THE FERTILITY-DECISION PROCESS

Work on the fertility-decision process is more scattered and more difficult to integrate than work on decision content. Work has progressed on specific questions like "What decision rule do people follow?" or "Who makes the final decision?", but there is no accepted paradigm that successfully knits together all these different facets of process. This treatment therefore is necessarily preliminary and speculative, though it refers to relevant empirical work wherever possible.

A basic question is whether there are different types of fertility decisions, or different approaches to making a decision. In providing a highly abbreviated overview of research on fertility decision-making, Bulatao and Lee (1982b) suggested a set of six decision strategies that usefully summarize several important variations in process. These strategies will be discussed and elaborated upon, and related to decision content and then to other specific facets of decisions.

Decision strategies

A fertility-decision strategy refers here to the general approach an individual takes in a particular situation requiring a decision or the way he or she goes about making a choice. Six strategies are proposed by Bulatao and Lee (1982b): the null strategy, denial, passive acceptance, active coping, advanced coping and sequential coping. It is suggested that one strategy is typically applied to a given decision, but a combination or succession of different strategies is also possible.

The null strategy fits the case where there is no significant imbalance between the supply of children and the demand for children. Imbalance refers to an excess of supply over demand, which can be reduced by regulation. A situation where there is an excess of demand over supply is generally more difficult to remedy, and attempts to do so are of less demographic consequence; for the present purposes such situations may be considered in balance. Thus the strategy applies where demand is equal to or greater than supply. Motivation to control fertility may then be said to be lacking, and consequently no intervention in the reproductive process is required, nor need any intervention even be considered. In this null case other decisions on breast-feeding, intercourse, marriage and separation and so forth will still be made; however, these will not be directed towards affecting the number of children, though they may have that effect. This null case may be considered a "non-decision", in which there is no instigation and no need to make choices; by contrast, all the other strategies are based on the need to reconcile desires and reality in situations in which they are not in balance. There is little evidence for this null case in the fertility-decision

literature, because researchers have generally not distinguished those with excess demand from those with excess supply. Luker's (1977) flow chart for risk-taking in fertility decisions does include a null case of a sort (for those who fail to pass the first "decision juncture" and therefore do not continue deliberation), but as she predicts non-contracepting rather than contracepting, the null case is the reverse of that discussed here.

Denial, the second strategy, involves the misperception of an imbalance between supply and demand or rationalizing it away. For instance, a couple may decide that an unintended birth is after all wanted; or they may convince themselves that, for whatever reason, conception is unlikely. Denial may be described as a way to pull a psychological trick on oneself in order to make imbalance disappear. It was argued above that some degree of rationalization affects, though it does not entirely determine, a number of the content elements: family-size desires adjust to accomodate unintended births, and susceptibility to conception is seen as higher or lower depending on whether one wants or does not want a birth.

The third strategy of passive or fatalistic acceptance involves recognizing an imbalance but not seeking to do anything about it. Other strategies can also lead to inaction, but through different routes. The null strategy leads to inaction because of an absence of conflict, the denial strategy because conflict has been rationalized away; passivity leads to inaction despite the continued presence of conflict. The more active strategies to be discussed next may also lead to inaction if that option is chosen; the difference is that, in the passive case, options are not seriously considered. Miller and Godwin (1977:75) describe passive decision-making as a situation in which ego does not take the initiative but merely accepts a decision "instigated by some external factor", and include under it decisions made by default. Miller and Godwin's description is sufficiently broad to include the two previous decision strategies, which, it is argued here, should be distinguished. Rather than emphasizing specific instigating events, Hull (1982) argues that passive acceptance is conditioned by the external culture and society, when they provide no decent alternatives for the individual to consider. ^{6/} Evidence for the use of a passive strategy might be gleaned from observational work or interviews showing that some people do not consider beforehand the fertility consequences of their actions or they accept the consequences fatalistically.

The remaining strategies involve actual consideration of alternatives and some weighing of behavioural consequences. The simplest of these is the fourth strategy, active coping, which involves "making a conscious, considered attempt to deal with imbalance, deliberately seeking to make the best of the situation" (Bulatao and Lee, 1982b). This strategy includes the utility maximization that is the central element of economic theories of fertility. Also included under active coping is the use of psychological decision rules. The two main rules that have been suggested, "value x expectancy" (Fishbein, 1972) and subjective expected utility (Townes and others, 1977), both assume that individual fertility behaviour, or at least behavioural intentions, are consistent with personal attitudes. Attitudes are assessed in two parts - the

value or utility of particular behaviour consequences and the expectation that the behaviour will in fact produce these consequences - which are combined by multiplication, with the products summed across all the relevant attitudes. These rules have mainly been applied to developed country samples, meeting with some success in predicting intentions or behaviour even in longitudinal studies, though details of the models have been called into question (Falbo and Becker, 1980). A greater problem that these models share with simple utility maximization, however, is their assumption of rationality in decisions. The psychological approaches have the advantage that rationality can be defined subjectively, so that distorted perceptions of utilities or expectations need not indicate non-rationality (Adler, 1979); nevertheless, it may still be questioned whether people regularly go through all the intricate steps - Leibenstein (1981) counts 13 - required to fully maximize.

An alternative to active coping or full maximization is the fifth strategy, advanced coping, which involves abbreviated systems for reaching decisions, saving on the decision-maker's effort but still leading to satisfactory choices. There are several ways to save on effort: to engage in partial rather than full calculation of the costs and benefits involved in the decision, such as in "satisficing", where an acceptable though not necessarily the best alternative is chosen; to rely on accepted social conventions rather than working out a personal solution; or to rely on habit or previously established routines rather than rethinking them (Leibenstein, 1982). The use of such procedures might be inferred from various respondents' reports - for instance, partial calculation may be illustrated in the trial-and-error process in choosing a contraceptive method.

The sixth strategy, sequential coping, is in some sense a subset of the fifth, but may also be seen as lying on a different dimension from the others. It involves rethinking the situation and adjusting one's response over time, as different factors in the decision change. Where there is great uncertainty over elements in a decision, or where one becomes aware of relevant considerations only gradually over time, sequential coping should be a more effective way of reaching decisions (Namboodiri, 1972), and in that sense a type of advanced coping. Each successive decision, however, will necessarily involve a choice among the other five strategies. In this sense, sequential coping lies on a different dimension. Changes over time in family desires strongly suggest that sequential coping is used at least some of the time (Namboodiri, 1982).

Strategies and decision content

Understanding a particular decision requires understanding which strategy has been applied and why. Many things may account for choice of strategy, but a key factor may well be the specific decision content: whether the values of children are greater than or less than the disvalues, how heavy particular regulation costs are and how great is the perceived childbearing potential. Some speculation on the links between content and strategy follows.

The null strategy may seem a likely choice when the individual has high family-size desires, or a great excess of values over disvalues of children. Regardless of the level of family-size desires, the null strategy is also likely when perceived childbearing potential is low or nonexistent. High family-size desires or low childbearing potential, or both together, would make it unnecessary to consider any family limitation. Even in the presence of high family-size desires, however, perceiving strong disvalues of children would probably prompt some reflection on the fertility decision, and therefore rule out this strategy. The level of perceived regulation costs is irrelevant here: whether they are high or low, they should not affect the outcome.

Denial takes place in more complex situations. Supply exceeds demand, and is brought into balance either through resignation (through deciding that family-size desires are higher after all) or through an act of hope (through deciding that perceived childbearing potential must after all be lower). The reason for such misperception must lie either in excessive disvalues relative to values attached to children (as is often the case among the unmarried, for instance, or among the poor who already have many children) or in high perceived regulation costs. Of the latter, information costs and availability costs particularly may be high, as may the proscription costs. High costs connected to method attributes, even the costs of side effects, would seem less likely to lead to a denial strategy.

Passive acceptance is used in circumstances that resemble those for denial. The difference may lie in the firmness or greater certainty of perceptions of childbearing potential; older women with more experience to go on, for instance, may be less able to deny their susceptibility to pregnancy. The difference may also lie in the relative excess of disvalues over values; when it is only slightly disadvantageous to have another child, for instance, it is easier to rationalize having it than when another child would be a serious misfortune.

One of the three coping strategies should be activated only if perceived childbearing potential is moderate, exceeding family-size desires, some disvalues of children are strongly felt and the information costs of regulation and the costs relating to violating personal beliefs are manageable, if not low or nonexistent. Such situations provide some incentive for thinking about regulating fertility, and having lower information and belief-violation costs makes it feasible to think about it. Coping may still be precluded by the other proscription costs, but this is not inevitable.

Distinguishing among the three coping strategies on the basis of decision content is more difficult, and may not in fact be possible. It has been argued that optimization is more likely to take place when fewer and simpler options are available (Mills and others, 1977). This would suggest that active coping is more likely if a choice has to be made between, say two or three children, as opposed to having to choose among several sizes of large families. It suggests also that choice of a regulation method will involve active coping only if a very limited range of methods is available; otherwise,

some form of advanced coping will be used. Somewhat higher information costs probably impede active coping, as might greater uncertainty about childbearing potential.

The several varieties of advanced coping - partial calculation, reliance on convention and reliance on routine - are probably each activated in different circumstances. The use of partial calculation or satisficing depends partly on the complexity of the alternatives for choice, as when a wide range of contraceptives has to be considered, or on the relative minuteness of the advantage provided by one outcome over another, as when different family sizes are about equally preferred. Reliance on convention may be most often related to strongly felt values of children or to high proscriptive costs of regulation, which would reinforce the choice of traditional options. Reliance on routine depends on the absence of any significant change in decision content since the previous decision.

The sequential strategy, by contrast, is useful if changes take place in decision content. It has been argued that fertility decisions should always be seen as sequential, since changes in the family, its functioning, its resources and the opportunities available for its members are inevitable over the reproductive span. The process of having children itself can affect the context for reproductive decisions. Not all changes require the reassessment of fertility goals, however; as Leibenstein (1981) argues, changes have to exceed certain bounds in order to overcome the inertia of previous actions and decisions. Changes have to be unanticipated, or they may already have been discounted in making earlier decisions. An unintended birth, the loss of a child and a child being of the "wrong" sex could each affect the demand for children (Lee and Bulatao, 1982), as could events external to the family, like wars and depressions. Similarly, a woman's experience affects her perceptions of her childbearing potential and her evaluations of the costs of different contraceptive methods. In addition to changes in content, sequential decision-making is of particular interest if it involves changes in the strategies used at different points in the reproductive span. For instance, the hypothesis is sometimes advanced that a passive strategy is applied until the pressure of excess supply becomes too great, at which point the individual switches to active or advanced coping (e.g., Kammeyer, 1971). Although this appears plausible, there are also indications that, even at low parities, people do consider logically some decision content, such as values and disvalues of children (Bulatao, 1981).

Stages in a decision

Another aspect of sequentiality in decisions is the various steps or sequences of cogitations, actions and events leading up to a choice. There are two basic ways to represent the stages in a fertility decision: as a series of micro-decisions on interrelated actions, one of which leads into the next, or as an information search process leading gradually to a final choice.

The first possibility may be represented by Hass' description (1974) of preconception, pregnancy and post-natal stages in fertility decision-making (see also Shedlin and Hollerbach, 1981). Each stage, in this scheme, concerns a distinct decision or sub-decision - the first stage about pregnancy, the second about birth and the third about child-rearing. Hass represents each stage as affected by a mix of attitudes, perceptions and couple communication, the pattern of elements being similar in each case but the substance changing. The usefulness of this scheme depends on the extent to which there is distinctive content at each stage: if someone considering pregnancy (and therefore contraception) weighs content elements different from those weighed by someone considering childbirth (and therefore abortion), then treating these as separate stages should be worthwhile. Much content may well be similar across stages, however; family-size desires, for instance, are probably important at each stage. The scheme may also be useful if distinctive strategies are typically applied at each stage. There is no necessity for the same strategy to be carried through all the stages, but there is no evident reason for arguing that particular strategies are more typical of one or another stage.

The second possible way to divide up a decision may be illustrated by Miller and Godwin's (1977) stages for decision-making: pre-awareness, awareness, consideration (which includes gathering information, understanding alternatives, evaluating, and developing strategy), implementation and adaptation (meaning psychological adjustment to the decision and its consequences). This set of stages parallels the stages involved in the process of adopting innovations (Rogers and Svenning, 1969). Another framework suggested by McClelland (1980) is essentially an expansion on a portion of these stages: it runs from judgement to valuation to integration to choice. With a sufficiently detailed set of stages of this sort, it would be possible to characterize the decision strategies described here by the stage the individual must reach before stopping the process: with the null strategy one need not get beyond the pre-awareness stage; with the passive strategy the process may terminate in the awareness stage; and with the coping strategies one goes at least as far as the consideration stage and possibly beyond. This schema of stages also helps focus on the gradual acquisition of information, and possibly experience from trial and error, to make up the decision content.

Schema like Miller and Godwin's are of course logically arranged idealizations of a much messier process. There is certainly great variability in the order of the psychosocial and behavioural events relating to a decision. Perhaps as a consequence, no real attempt to confirm the existence of such stages in fertility decisions has been made. One approach might be to develop flow charts for particular individual's decisions, with decision points where the process may be terminated or continued, abbreviated or complicated, and to determine how closely these resemble any particular schema of stages. Luker's (1975, 1977) theory of contraceptive risk-taking and Miller and Godwin's (1977:87) representation of part of the contraceptive adoption process both provide types of flow charts that suggest such an approach.

Participants in a decision

That others besides the couple participate in fertility decisions is often alleged. Caldwell (1976) in fact makes it a key premise of his explanation for high fertility in developing countries that the real decision-makers are not the couple themselves but the elders in the family. Various studies have suggested that members of the extended family, peer groups and medical and paramedical personnel sometimes exert influence on fertility decisions (Beckman, 1982). However, there is also evidence to the contrary, that couples typically make fertility decisions themselves. The cross-national value-of-children study found that respondents almost always thought about children in personal terms, seldom in terms of the good of the collectivity. Social pressures to have children were rarely mentioned, were rated well below other reasons and correlated poorly if at all with fertility preference (Arnold and others, 1975; Bulatao, 1975). Respondents clearly believed that the fertility decisions were their own.

A convenient way to think about the contributions of others to a decision is to assume that they participate in the decision process only indirectly, through influence on decision content. The final choices, after all, have to be made by the couple themselves, without whom no decision could be effective. The decision process should therefore be defined by what the couple goes through. This perspective can accomodate the apparently conflicting findings: the fertility decision will still ultimately belong to the couple, but the possibility of outside influence is preserved. The critical questions, from this perspective, would be what types of content are affected by particular people and how great their influence is in relation to other factors. For instance, among the influences on subjective costs related to method attributes, clinic personnel may be of particular importance, their influence often having a different effect from the influence of peer groups. Or, to take another example, it might be hypothesized that perceived childbearing potential is determined largely by experience and popular beliefs, rather than by any specific source of information. It may also be hypothesized that the influence of kin is greatest on the values of children (not including disvalues); though relatives' opinions may also affect the proscription costs of regulation, the influence of peers or the community generally may be greater.

Restricting the decision-makers to the couple themselves still leaves the question of how two people co-ordinate their opinions and efforts. In some cases they do not; decisions are made unilaterally, perhaps surreptitiously, by one spouse, as among those women who decide to have an abortion on their own (e.g., Browner, 1979). The degree of communication between spouses may depend on how similar is the decision content they consider. Great discrepancies in the perceptions of the partners may be related to unilateral decisions, or at least to limited communication. Communication of course changes the decision content with which each spouse must deal, and may therefore be most important particularly where the differences in content are greatest. An additional

consideration is the similarities or differences in the strategies the partners employ. A passive strategy on the part of either partner, or on the part of both, would be less likely to lead to communication.

Given that communication takes place, and that both partners are therefore probably trying to cope, the question may be raised how differences or disagreements are resolved. Two divergent approaches have been taken to this question: analysis of situations from the standpoint of game theory (e.g., Meeker, 1980) and attempts to measure power in the dyad and verify that relative power explains whose views prevail (see Beckman, 1982). Neither approach has been particularly successful. Much more detailed work on the specific content for each spouse and the stages each goes through is probably necessary before adequate generalizations can be made about the complex and continually changing bargains couples strike to resolve disagreements about fertility.

CONCLUSION

On the basis of the concepts of decision content and the decision-making process, a summary has been presented here of the factors entering fertility decisions and the strategies people use in making them. Four distinct categories of decision content have been identified: family-size desires, values and disvalues of children, subjective costs of fertility regulation, and perceptions of childbearing potential. Six strategies applied to decisions in one context or another have been distinguished, related to differences in decision content, and discussed in relation to the stages in a decision and the participants in it.

The fertility transition involves major changes in decision content (Easterlin, 1982; Bulatao and Lee, 1982b). Family-size desires fall, together with a drop in the economic value of children and a rise in the restrictions they impose on parents. The subjective costs of regulation also fall: contraceptives become more available, fears about side effects are dissipated, and proscription costs gradually ease. Perceptions of childbearing potential may possibly increase; perceptions of child survival certainly do increase. Given such changes, the fertility transition also involves alterations in decision strategies, with the less active being replaced by the more active.

Changes in decision content are tied to changes in the socio-economic setting; however, it has also been noted that perceptions are not always veridical, and can presumably be influenced in particular directions by appropriately designed communications programmes. Many decisions are based on inaccurate perceptions, or exclude particular elements from content that should in fact be considered, or involve strategies that do not lead to the greatest possible benefit for the couple. There is much scope, then, for affecting fertility decisions, and for making them more responsive to the contingencies that couples actually face.

Notes

1/ This report contains 40 papers by different authors reviewing research on specific fertility determinants in developing countries.

2/ This usage differs from that of others (e.g., Knodel and Prachuabmoh, 1973). McClelland (1982) distinguishes these two types by labelling them "over again" and "how many more" questions.

3/ To the extent they are deliberately used to prevent births, prolonged breast-feeding and abstinence may also be included.

4/ Easterlin does not include health costs.

5/ By contrast, Easterlin (1978) equates the economic and the access costs.

6/ Leibenstein (1981:391) describes passive decisions as equivalent to routine decisions, which are "insulated from outside events". This description contrasts with Miller and Godwin's (1977) description of passivity as forced by external events. It seems appropriate to treat Leibenstein's type of passivity not here but under advanced coping.

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C. Socio-economic determinants of achieved fertility in some developed countries: A multivariate analysis based on World Fertility Survey data

Economic Commission for Europe

INTRODUCTION

The socio-economic differentials in human fertility have been of interest to demographers, other social scientists and policy-makers for quite some time. The availability of World Fertility Survey (WFS) type of data for developed countries provides an opportunity for studying this topic in a comparative framework for a number of countries in Europe and the United States of America. The main responsibility for the promotion of the WFS type of surveys in Europe (and in some developed countries outside Europe), and for the comparative analyses of their findings, was entrusted to the Secretariat of the United Nations Economic Commission for Europe (ECE). The final report of this project will focus on the causes of recent fertility decline in the ECE region and will also use data derived from sources other than the WFS type of surveys in Europe and Northern America. This paper is a part of the effort to summarize the main findings before the publication of the final report.

A cross-tabular analysis of the above-mentioned data carried out by ECE has suggested that despite the low level of childbearing that prevails in developed countries, many socio-economic differentials in fertility persist.^{1/} In this analysis differentials in achieved fertility were examined for some 18 different socio-economic variables representing wife's background, wife's circumstances at the time of the survey and wife's employment. Generally, substantial differentials were found for current residence, wife's education, wife's work history, wife's full-time/part-time work, husband's education and husband's occupation. The importance of these differentials, however, varied across countries and some indications of regional patterns were found. The present report, as an extension of the previous work, examines the impact of these apparently important socio-economic characteristics on achieved fertility in a multivariate framework of analysis.

DATA AND METHODOLOGY

The surveys

Data from 13 surveys ^{2/} participating in the ECE/WFS Comparative Fertility Study are analysed in this report. These surveys have been selected because individual level data are available for them in approximately comparable form for most of the variables considered in this report. The

surveys were conducted within a relatively short span of five years from 1975 to 1979. The samples are nationally representative, except for Belgium for which only the Flemish-speaking part of the population was covered. Although the original definition of the samples differed somewhat across countries, it was possible, with very few exceptions, to select a common base for comparative purposes, consisting of currently married women in their first marriage, below the age of 45. The exceptions are France, Hungary, the Netherlands and Poland. In the case of Poland, currently married women who had been married more than once could not be identified separately. The original French sample excluded women less than 20 years of age, the Dutch sample consisted of women married in the years 1963-1973 and the Hungarian sample included only women below the age of 40.

Dependent variable and demographic controls

The dependent variable, achieved fertility, was measured as the number of live births the respondent had had up to the date of the survey. The cross-sectional nature of the surveys of women at different stages of family-building, and the close association of cumulative fertility with marriage duration, complicated the analysis. Nevertheless, this measure was chosen because it was close to the concept of individual fertility, commonly used in fertility research, concrete in nature and easy to obtain. In all of the surveys this information was obtained through a direct question on total number of live births, except in Finland, Hungary, Italy and Yugoslavia, where it was extracted from the birth histories. No major problems as to the inter-country comparability of these data were encountered.

Marriage duration and age at marriage are controlled throughout the analysis presented below. The control for marriage duration is needed because of its strong association with the number of children ever born and its relationship with socio-economic factors. The control for age at marriage is introduced for two reasons. First, an analysis of these data (results not shown) suggests that, in developed countries, age at marriage not only exerts some independent effects on fertility but also has effects that overlap those of socio-economic variables. Secondly, age at marriage together with duration of marriage provide an implicit control for age, and, hence, for biological factors associated with age. Another behavioural factor that needs to be controlled is nuptiality. Most of the effects of this factor have been removed by restricting the analysis to currently married women in their first marriage.

In the original data both of the control variables are interval-scaled measures, and in neither case is the relationship with fertility linear. In the following analysis, these two variables are introduced as classifications, categorized as follows:

Marriage duration:	5, 5-9, 10-14, 15-19, 20 or more years
Age at marriage:	20, 20-21, 22-24, 25 or more years.

Socio-economic factors

Five socio-economic characteristics were selected for analysis, partly because of the evident strength of their relationship with achieved fertility in developed countries,^{3/} partly because they represented interesting and varied substantive areas, and partly on practical grounds of data availability. These variables were as follows: (a) wife's level of education; (b) type of current residence; (c) husband's level of education; (d) husband's socio-occupational status; and (e) wife's work history. Each of these variables is utilized in a classification designed to achieve maximum comparability among countries. Table 1 presents a summarized description of the socio-economic and demographic variables used in this study, either in terms of averages or as percentages of respondents in specified categories. It is evident that the surveys included in this report represent a range of socio-cultural diversities existing within developed societies. A brief account of the socio-economic variables follows.

Wife's level of education. This measure represents the level of education completed by the respondent. The standard classification covered five categories (elementary not completed, elementary, lower secondary, higher secondary, post-secondary); however, for several countries the first two categories were combined. Efforts were made to achieve comparability in this classification; however, strict equivalence was not always feasible owing to disparities in the base information. This lack of comparability, however, is not crucial to the analysis since our interest is in educational differences in fertility for a given educational category.

Type of current residence. The rural/urban type of residence classification was generally based on definitions adopted by countries. These definitions and the input information for them varied across countries. Essentially there were three criteria for distinguishing urban from rural place of residence at the time of the survey; population size, legal or administrative status and socio-economic characteristics. While the proportions of the sample population residing in urban areas matched the national estimates for around 1975 fairly closely, there was reason to question the representativeness of the Spanish data, which implied an unduly high level of urbanization. Also, the Italian definition was exceptionally restrictive since only communities with 20,000 or more inhabitants were classified as urban places. Two countries, the United Kingdom and the United States, did not have data available for this classification, probably because of increasing homogeneity of the population with regard to urbanization.

Husband's level of education. The construction of this variable was in most respects identical to that of wife's level of education. The rate of non-response for this item, however, was somewhat higher than that for wife's education, amounting to 5 per cent of the sample in the case of Finland. This variable was available for all countries included in the study, except Czechoslovakia.

Husband's socio-occupational status. This classification was used as an indicator of social status. It consists of four broad categories (agricultural, manual outside agriculture, non-manual outside agriculture, other), which were established from information on husband's occupation. Although the detail of the occupational classification varied from country to country, it was not difficult to establish a reasonably comparable classification of the socio-occupational status of husband for 12 of the 13 surveys considered here. The Czech survey did not include information relevant to this classification.

Wife's work history. This summary variable indicated whether the respondent was working at the time of the interview, whether she was not working then but had worked at some time since marriage, or whether she had not worked at all since marriage. It was possible to construct a classification consisting of these three broad categories for all the countries considered here. The detail of the input information and the concept of "work" implied in it varied from country to country.

Statistical framework

Multiple Classification Analysis (MCA) ^{4/} and Analysis of Variance (ANOVA) were used to study the effects of each independent variable on achieved fertility. After the two control variables, marriage duration and age at marriage, were entered, the socio-economic variables were introduced into the analysis in the order in which they are listed earlier here, which is intended to follow at least a rough sequence of increasing proximity to the respondent's fertility decisions. Based on substantive and practical considerations, up to a total of 10 additive models are fitted for each country. These models are listed as steps 1 to 10 in table 2. For example, in step 2 the fitted model is as follows:

$$\bar{Y}_{hij} = \bar{Y} + (MD)_h + (AM)_i + (WE)_j + e_{hij} \quad (1)$$

where $(WE)_j$ is the effect of the j^{th} category of wife's education (WE), adjusted for marriage duration (MD) and age at marriage (AM); \bar{Y} is the overall mean of achieved fertility; and $e_{hij} = \bar{Y}_{hij} - \bar{Y}$ is the difference between the actual and predicted means for the cell (h, i, j) in the cross-tabulation of Y by MD, AM and WE.

Each of the socio-economic characteristics is considered first adjusted only for marriage duration and age at marriage. This indicates the "gross" effects of the factors considered. Additional comparisons are then shown indicating the "net" effects after adjustment for other socio-economic variables. The extent to which the effects of the various characteristics overlap with one another can be assessed in this way.

Ten countries have the necessary information on all five of the socio-economic variables as well as both of the demographic controls. The remaining three countries, Czechoslovakia, the United Kingdom and the United States, have data for the demographic controls and one or more of the variables of substantive interest and can be brought into some parts of the analysis.

Three summary measures of the impact of an independent variable are given at each step. The first is added R^2 , i.e., the extent to which the proportion of total variation that can be explained is increased by the inclusion of that particular variable. The second is the average difference between the adjusted means, formed by summing their deviations from the unweighted mean of all the categories and dividing by the number of categories. Lastly, an asterisk is shown where the overall effect is statistically significant at the .01 level. For reference purposes, the proportion of total variance explained by each combination of variables considered is shown in table 2.

The fitted MCA models are based on the assumption that there is no interaction among the variables that are under consideration at any given point, including the demographic controls. The implication is that the relationship of each of the variables with achieved fertility is the same within all categories of the other variables. To check the validity of this assumption and to identify the places where qualifications of the basic results would be necessary, systematic tests for the presence of two-way interactions were carried out using the ANOVA procedure. Higher order interactions were not considered. Table 3 shows the contribution to R^2 of all two-way interactions that were found to be significant at the 0.01 level. 5/ The interaction effects not shown in the table were very small in magnitude. Interactions among socio-economic factors proved to be few in number and generally small in magnitude, but they have direct implications for the interpretation of interrelations among the characteristics under study. Therefore, in order to estimate these interaction effects directly, the relevant step was repeated for the country in question, replacing the two variables with a new variable formed by combining their categories (tables 9 to 12). These results are covered at the appropriate points in the discussion.

If two independent variables are highly correlated with one another, problems of multi-collinearity are likely to arise. This possibility was assessed with the aid of cross-tabulations of each pair of independent variables and no major problems were encountered. When it came to the detection of interaction effects, however, multi-collinearity arose at several points, due to the high degree of association between the categories and the interaction terms in which they appeared. Empty cells posed similar difficulties for these calculations. In all such cases, it was possible to obtain the necessary results by merging categories for certain variables.

Sampling weights were required to obtain unbiased results for 6 out of the 13 surveys: France, Italy, the Netherlands, Spain, the United States and Yugoslavia. Weighting presents a complex problem in multivariate procedures of this sort. While weights are appropriate for estimation of the effects

themselves, the F-statistic becomes difficult to interpret. A compromise solution was adopted here whereby the sampling weights were "normalized", making the weighted number of cases approximately equal to the unweighted number.

RESULTS

Wife's education

After adjusting for marriage duration and age at marriage, wife's level of education was negatively related to achieved fertility in Czechoslovakia, the Netherlands, Norway, Poland, the United States and Yugoslavia, while in Belgium and Spain no systematic pattern emerged (table 4, upper panel). In the rest of the countries the negative relationship was restricted to the lower levels of education. In addition to Belgium, where the effects were not statistically significant, the effects of wife's education were rather weak in Finland, the Netherlands, Norway and the United Kingdom; the additional variance explained by wife's education was less than 1 per cent in these countries. In Hungary and Poland, on the other hand, the effects of wife's education were relatively large; the added R^2 was around 6 per cent, and the average difference was over one third of a child.

The lower panel of table 4 shows the means by wife's level of education adjusted for type of place of current residence and work history as well as the two demographic controls. These are the other socio-economic variables that proved ultimately to have the most bearing on achieved fertility. However, the picture for wife's level of education is not greatly altered. The average difference declined somewhat for most countries; usually the adjusted average number of births were reduced for the lower levels of education and raised for the higher levels of education, but in the three southern countries the change was more pronounced among the better educated groups of women (Italy, Spain, Yugoslavia). The contribution to variance explained was virtually identical, and the overall effect of wife's level of education remained significant in those countries for which this combination of characteristics was available. Although it does not attain significance, it is worth noting for Belgium some strengthening of a positive relationship by education that was already perceptible in the results adjusted only for the demographic variables. In this instance, work history may be associated with education in such a way as to partly counterbalance the effects of the latter on achieved fertility.

Current residence

In all the countries for which information was available on the current residence of the respondent, the urban residents had lower achieved fertility than those of the rural residents. This relationship held even when marriage

duration and age at marriage were controlled (table 5, upper panel). Nevertheless, the effects of residence on achieved fertility appeared to be unimportant in Belgium, Italy and Spain and, although statistically significant, the effect was small in the Netherlands. On the other hand, urban residents have at least half a child fewer than rural residents in Poland and Yugoslavia. This difference amounted to more than one third of a child in the case of Finland, and about one fourth of a child in Czechoslovakia, France, Hungary and Norway. Knowledge of whether the respondent was living in a rural or an urban area added 5 per cent to the proportion of the overall variance that could be explained in Poland and around 2 per cent in Finland, Hungary and Yugoslavia. These four countries were also the ones where interaction between type of current residence and marriage duration was significant; the interaction term added over 1 per cent to R^2 in Poland.

Adjusting for wife's level of education in addition to the demographic control reduced the impact of type of current residence considerably in Czechoslovakia, Hungary, Poland and Yugoslavia (table 5, middle panel). In these countries the effect of residence could thus be accounted for to some extent by urban/rural differences in the educational structure of the female population of reproductive age. Type of current residence nevertheless remained important in Poland as well as Finland, and its effect was still significant in other countries where this was originally the case.

Some interaction between wife's level of education and type of current residence was detected in Hungary, Italy and Poland. The averages cross-classified by the two variables and adjusted for marriage duration and age at marriage are shown for these three countries in table 9. The nature of the departure from the additivity appears to be somewhat different in each case. The residence differential for Hungary was much greater for the least educated women, and correspondingly, the drop in the mean from this to the next higher education group was twice as large for rural as for urban women. In Italy, there was no residence differential except at the end of the educational scale, where the rural averages were higher, especially for women with some post-secondary education. The relationship by education was almost U-shaped for Italian rural women where it was no more than a shallow negative curve for urban women. Although there is some irregularity in the figures, the departure from additivity is much less obvious in the case of Poland; it contributes only .1 per cent to R^2 and is statistically significant mainly because of the large size of the Polish sample.

Further adjustment for work history does not change the effect of type of current residence appreciably in any country (table 5, lower panel). Current residence appears to affect achieved fertility independently of differences in work experience that may exist between the two types of area.

Husband's education

The overall impact of husband's level of education, after adjusting for duration of marriage and age at marriage, was somewhat less than that of wife's level of education in most but not all countries (table 6, upper panel). In Poland, achieved fertility monotonically declined with husband's education and the association between these two variables was stronger than in any other country considered. Husband's level of education explained as much as 6 per cent of the total variation in Poland, and the average difference was nearly half a child. The negative association was also evident in Hungary, the United States and Yugoslavia, but the average difference was around one quarter of a child. In Italy, although the average difference was one quarter of a child, the negative relationship was restricted only to women whose husbands had secondary or less education. Interaction between husband's level of education and one or the other of the demographic controls occurred in certain of the countries where interaction was also found between wife's level of education and the demographic variables: Poland and Yugoslavia for duration of marriage; France, the Netherlands and Spain for age at marriage.

Not surprisingly, the influence of husband's level of education was greatly diminished when wife's level of education and type of current residence were also held constant (table 6, lower panel). Husband's level of education clearly overlapped very largely with wife's level of education and, either via this route or independently, also with type of current residence. Although its effect remained statistically significant at the .01 level in several countries, the additional variance explained dropped below 1 per cent everywhere, and the average difference was as high as one fifth of a child only in Poland. Both ends of the education scale were affected for the most part, but in Spain and Yugoslavia the difference consisted mainly of increases in the adjusted averages for women with secondary or higher education.

Interaction between wife's and husband's level of education proved to be significant at the .01 level for France. When the two were cross-classified, the results adjusted for marriage duration, age at marriage and residence revealed a shift in the direction of the relationship by wife's level of education as husband's level of education increased (table 10). Whereas the adjusted averages generally declined from the lower to the higher levels of wife's education among the wives of men with lower secondary education or less, they tended to rise among the wives of men with higher secondary or more education.

The fact that the two education variables are so closely related suggests that it would be unprofitable to retain both of them in further steps of the investigation. Although wife's level of education does appear to be the more important of the two, the question of which to keep depends principally on the point of view taken. The logic of this analysis suggests that the respondent's level of education is antecedent in the sense that it is furthest removed from her fertility decisions and could in turn have been one determinant of the choice of marriage partners that she would ultimately make. For this reason husband's level of education was dropped at this point.

Husband's socio-occupational status

When controlled only for the demographic variables, highest level of achieved fertility persisted among women whose husbands were engaged in agricultural occupations. This was true in all countries except France (table 7, upper panel). Once again the percentage of variance explained was highest in Poland, but it was 1 per cent or greater in France, Hungary, the Netherlands and Yugoslavia as well. Mainly because the small category of agricultural workers was highly deviant, the average difference was relatively large in Belgium, Italy, the Netherlands and the United States. Interaction between husband's socio-occupational status and marriage duration accounted for more than 1 per cent of total R^2 in Poland and was significant also for France and Yugoslavia. Interaction with age at marriage was found to be significant for France.

Adjusting in addition for wife's level of education and residence reduced the differences by husband's socio-occupational status. This was also evident in the reduction of contribution to R^2 to well below 1 per cent in all countries (table 7, lower panel). The average difference remained as high as one fifth of a child only in Belgium and the Netherlands where the effect of agricultural occupations continued to be strong. As compared with the results controlled only for demographic variables, the drop in the adjusted average number of births for agricultural workers was substantial for France, Italy, Poland and Yugoslavia, while there were large rises in the adjusted averages for wives of non-manual workers outside agriculture in Hungary, Poland and Yugoslavia. Despite the weakness of the effect of socio-occupational status at this step, in the case of Italy there was some interaction between socio-occupational status and residence. As shown in table 11, the adjusted mean for rural wives of manual workers is unexpectedly low; the group is of substantial size, and there does not appear to be any ready explanation for this phenomenon.

When controlled for these additional variables, the effect of socio-occupational status as a whole was no longer statistically significant in Hungary, Norway and Yugoslavia. Because of its apparent lack of independent effect on achieved fertility, husband's socio-occupation status was dropped, along with husband's level of education, from the remaining steps of the exercise.

Work history

Whichever measure of overall impact is utilized, the respondents' work history appears to be the most important variable of the five selected for this analysis. With marriage duration and age at marriage kept at a constant, work history was statistically significant at the .01 level in every one of the 13 countries, its contribution to variance explained was over 2 per cent in 10 countries and over 8 per cent in two, and in half of the countries the average difference was over one fifth of a child (table 8, upper panel). It is noteworthy that among all the countries the effects of work history were

weakest in Poland, while most of the other variables were stronger there, and at the same time work history was important in Belgium, where other characteristics usually made little difference. These substantial main effects carry over into a considerable number of interactions between work history and the demographic variables: with marriage duration for Czechoslovakia (added R^2 of nearly 3 per cent), Finland, the Netherlands, Poland, the United States, the United Kingdom and Yugoslavia; with age at marriage for France.

On the whole the effect of work history was not much affected by the addition of wife's level of education and residence to the control group (table 8, lower panel). The variable was still significant in all of the countries for which this combination of characteristics was available, and the proportion of total variance explained declined little except in Poland and Yugoslavia, where it was about half of its previous value. The latter phenomenon was owing to a decline in the adjusted average number of births for women who had worked only before marriage or never in Poland, and to this change along with a rise in the averages for the other categories in Yugoslavia. In Czechoslovakia and Hungary, the adjusted averages for women who had worked only before marriage or never also dropped. This implies that in these Eastern European countries low education and/or rural residence is associated with not being employed after marriage, although elsewhere the impact of women's work history is essentially independent. Interestingly, both added R^2 and the average difference rose slightly for Belgium, giving further credence to the possibility mentioned above that education and work history may have opposing effects in that country.

At this last step interaction between wife's level of education and work history proved to be a significant consideration in France, Hungary and Italy. The means for combined categories of these two variables, adjusted for marriage duration, age at marriage and residence are shown in table 12. In all three countries the adjusted means for women who had worked only before marriage, or never, vary irregularly by education, and they are sometimes higher and sometimes lower than those for women who were not currently working but who had worked since marriage. Hungarian women who had no more than elementary education and had not worked since marriage had considerably more births than would have been expected on the basis of either one of these characteristics alone. In France and Italy, the effect of current employment also declines somewhat as the respondent's education increases.

CONCLUSIONS

Achieved fertility has reached very low levels in Europe and the United States. The average number of children ever born to married women in their first marriage below age 45, standardized by duration of marriage, is close to 2.00. In this context of generally low fertility, it is interesting that many socio-economic differentials persist. In general, the differences by residence and education tend to be more pronounced in Eastern Europe and the neighbouring countries of Finland and Yugoslavia. This is less true on the

whole of the characteristic related to women's work, perhaps because the employment of married women is more taken for granted in most of these countries than in other parts of Europe.

On the other hand, there appears to be remarkably little contrast within Belgium, Italy and Spain. For Belgium this is more or less to be expected from the results of other studies. But for Italy and Spain it is somewhat surprising, especially since their experience of fertility decline has been relatively recent. Problems of measurement may be responsible in the case of certain specific variables, but the situation warrants examination in greater detail. The respondent's work experience is nevertheless quite important in these three countries, especially Belgium.

The strongest differentials found were those by current residence, wife's level of education and wife's work history. In some of the Eastern European countries the effects of work history and, to a larger extent, those of residence could be explained by wife's level of education, but on the whole these three characteristics appeared to be independently related to achieved fertility. Once residence and wife's education were accounted for, the variation by other characteristics such as husband's level of education and husband's socio-occupational status was usually much reduced.

The existence of substantial differentials by various aspects of women's employment suggests the possibility of policy formulation in this area. However, it should be noted that data of this type provide no way of ascertaining the extent to which employment decisions are actually antecedent to fertility decisions. For instance, women who are sub-fecund, or who restrict their fertility for other reasons, may work with greater frequency simply because there are fewer children to make demands on their time. What is eminently clear from these results is that the two activities are highly incompatible. The details of this picture that have emerged support the hypothesis that the work opportunities available to women in developed societies tend to compete directly with family responsibilities for a woman's time and attention. But other approaches will be needed to identify the specific mechanisms linking work and childbearing and the conditions under which employment is likely to play the determining role.

Finally, two special patterns in the socio-economic differentials deserve comment which are specific to certain groups of countries, primarily in the North and West. The first is the tendency for achieved fertility to be positively related to husband's levels of education at the upper end of the education scale, inviting speculation that at this level childbearing is associated with a higher standard of living. The second is the interaction of work history with wife's level of education. The wife's employment experience often has a greater effect within the low education categories. There are several reasons why this might be so: women who are less well educated may need to work longer hours at jobs that are less flexible and may not have as easy access to alternate forms for child-care.

Notes

1/ For an advance report of this analysis, see Elise F. Jones, "Socio-economic differentials in achieved fertility", WFS Comparative Studies Series (forthcoming).

2/ For a general description of these and other surveys covered in the ECE/WFS Comparative Fertility Study, see J. Berent, E.F. Jones and M.K. Siddiqui, "Basic characteristics, sample designs and questionnaires", Comparative Studies: ECE Analyses of WFS Surveys in Europe and the USA, No. 18, (December 1981).

3/ Jones, op. cit.

4/ For details on MCA, see R. Little, "Linear models for WFS data", WFS Technical Bulletin, No. 9 (London, 1980); Nie, Norman and others, Statistical Package for the Social Sciences (New York, McGraw-Hill Book Company, 1975).

5/ The tests refer to the first step in the analysis at which the particular pair of variables was encountered (see table 2).

Table 1. Demographic and socio-economic characteristics of the study of populations

Country	Survey year	Average number of live births	Wife's Education		Residence	Husband's education		Husband's socio-occupational status			
			Mean age at marriage	Elementary or less		Higher secondary or more	Urban	Elementary or less	Higher secondary or more	Agricultural	Non-manual	Never worked
			----- (percentage) -----								
Belgium	1975/76	1.78	21.6	40	27	85	33	36	4	43	13
Czechoslovakia	1977	2.00	21.1	19	54	74	..	..	..	..	2
Finland	1977	1.84	22.2	37	37	62	40	38	17	37	3
France	1977/78	2.02	21.7	49	33	73	41	30	7	50	11
Hungary	1977	1.64	20.6	9	37	51	11	33	21	23	5
Italy	1979	1.96	22.6	59	21	35	50	25	7	49	29
Netherlands	1975	1.51	22.4	13	22	77	14	34	5	53	4
Norway	1977/78	2.00	22.0	8	52	48	10	60	6	44	2
Poland	1977	2.00	21.6	43	37	61	37	31	18	26	7
Spain	1977	2.36	22.9	79	11	75	69	21	12	33	25
United Kingdom	1976	1.89	21.7	8	41	..	15	38	3	46	1
United States	1976	1.99	20.7	6	79	..	7	79	2	52	7
Yugoslavia	1976	2.19	20.4	84	16 <u>a/</u>	57	80	20 <u>a/</u>	22	29	50

a/ Lower secondary or more.

Table 2. Proportion of total variance explained assuming additivity

Combination of variables considered at each step <u>a/</u>	Step number	Belgium	Czecho- slovakia	Finland	France	Hungary	Italy	Nether- lands	Norway	Poland	Spain	UK	USA	Yugo- slavia
MD, AM	1	.271	.173	.291	.288	.174	.251	.314	.347	.274	.261	.335	.400	.209
MD, AM, WE	2	.272	.212	.296	.311	.239	.288	.317	.356	.332	.272	.339	.419	.250
MD, AM, R	3	.271	.185	.310	.295	.193	.251	.317	.358	.324	.261	..	..	.233
MD, AM, WE, R	4	.272	.218	.313	.317	.246	.288	.320	.365	.356	.272	..	..	.257
MD, AM, HE	5	.274	..	.294	.299	.210	.274	.318	.352	.331	.272	.337	.414	.240
MD, AM, WE, R, HE	6	.275	..	.314	.320	.251	.294	.321	.367	.364	.276	..	..	.261
MD, AM, HS	7	.276	..	.298	.298	.186	.257	.325	.354	.316	.263	.338	.406	.223
MD, AM, WE, R, HS	8	.278	..	.316	.321	.247	.293	.328	.367	.361	.272	..	..	.257
MD, AM, WH	9	.299	.205	.307	.351	.273	.272	.395	.370	.280	.276	.367	.425	.250
MD, AM, WE, R, WH	10	.302	.242	.327	.368	.314	.306	.397	.385	.359	.287	..	..	.278

a/ MD = Duration of marriage

AM = Age at marriage

WE = Wife's education

R = Residence

HE = Husband's education

HS = Husband's socio-occupational status

WH = Wife's work history

Table 3. Contribution to R^2 of interaction terms that are significant at the .01 level

Country	Interaction <u>a/</u> and step number																	
	MD.AM	MD.WE	MD.R	MD.HE	MD.HS	MD.WH	AM.WE	AM.R	AM.HE	AM.HS	AM.WH	WE.R	WE.HE	WE.HS	WE.WH	R.HE	R.HS	R.WH
	(1)	(2)	(3)	(5)	(7)	(9)	(2)	(3)	(5)	(7)	(9)	(4)	(6)	(8)	(10)	(6)	(8)	(10)
Belgium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czechoslovakia	-	-	-	..	..	.028	-	-	..	..	-	-	..	..	-	..	..	-
Finland	.003	.004	.003	-	-	.004	-	-	-	-	-	-	-	-	-	-	-	-
France	.015	-	-	-	.009	-	.013	-	.005	.005	.009	-	.004	-	.007	-	-	-
Hungary	.004	-	.004	-	-	-	-	-	-	-	-	.003	-	-	.006	-	-	-
Italy	.009	.004	-	-	-	-	.004	-	.002	-	-	.002	-	-	.003	-	.002	-
Netherlands	-	.004	-	-	-	.008	-	-	-	-	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	.004	.010	.016	.010	.013	.003	-	-	-	-	-	.001	-	-	-	-	-	-
Spain	-	-	-	-	-	-	.005	-	.003	-	-	-	-	-	-	-	-	-
United Kingdom	-	-	..	-	-	.007	-	..	-	-	-	..	..	..	..	..	..	..
United States	-	-	..	-	-	.009	-	..	-	-	-	..	..	..	..	..	..	..
Yugoslavia	.006	.008	.004	.004	.004	.014	-	-	-	-	-	-	-	-	-	-	-	-

$a/$ MD = Duration of marriage

AM = Age at marriage

WE = Wife's education

R = Residence

HE = Husband's education

HS = Husband's socio-occupational status

WH = Wife's work history

Table 5. Effect of type of current residence on achieved fertility

	Belgium	Czecho- slovakia	Finland	France	Hungary	Italy	Nether- lands	Norway	Poland	Spain	UK	USA	Yugo- slavia
<u>Effects adjusted for marriage duration and age at marriage</u>													
Urban	1.82	2.20	2.08	2.20	1.78	1.98	1.61	2.15	2.37	2.37	..	..	2.42
Rural	1.78	1.93	1.72	1.94	1.50	1.90	1.49	1.89	1.76	2.34	..	..	1.93
Added R ²	.000	.013	.019	.007	.019	.001	.002	.011	.050	.000	..	..	.024
Average difference	.02	.14	.18	.13	.14	.04	.06	.13	.31	.02	..	..	.25
Significant at .01 level	*	*	*	*	*	*	*	*	*	*	..	..	*
<u>Effects adjusted for marriage duration, age at marriage and wife's education</u>													
Urban	1.83	2.14	2.07	2.19	1.73	1.96	1.61	2.14	2.27	2.35	..	..	2.30
Rural	1.78	1.95	1.73	1.94	1.55	1.92	1.49	1.90	1.83	2.35	..	..	2.02
Added R ²	.000	.006	.017	.006	.007	.000	.002	.009	.024	.000	..	..	.007
Average difference	.03	.10	.17	.13	.09	.02	.06	.12	.27	.00	..	..	.14
Significant at .01 level	*	*	*	*	*	*	*	*	*	*	..	..	*
<u>Effects adjusted for marriage duration, age at marriage, wife's education and work history</u>													
Urban	1.86	2.14	2.07	2.18	1.71	1.97	1.58	2.14	2.28	2.36	..	..	2.33
Rural	1.78	1.95	1.73	1.95	1.58	1.90	1.50	1.91	1.82	2.35	..	..	2.00
Added R ²	.000	.006	.017	.006	.007	.000	.002	.009	.024	.000	..	..	.007
Average difference	.04	.10	.17	.12	.07	.04	.04	.12	.23	.00	..	..	.17
Significant at .01 level	*	*	*	*	*	*	*	*	*	*	..	..	*

Table 9. Effect of wife's level of education and type of current residence combined on achieved fertility, adjusted for marriage duration and age at marriage

Wife's level of education					
Country and type of current residence	Elementary not completed	Elementary completed	Lower secondary	Higher secondary	Post secondary
Hungary					
Rural	-----2.60-----		1.68	1.58	1.62
Urban	-----1.96-----		1.57	1.39	1.39
Italy					
Rural	2.66	1.97	1.73	1.73	2.26
Urban	2.46	1.96	1.78	1.71	1.71
Poland					
Rural	3.14	2.54	2.04	2.02	1.93
Urban	2.75	1.96	1.81	1.60	1.52

Table 10. Effect of wife's and husband's level of education combined on achieved fertility, adjusted for marriage duration, age at marriage and type of current residence, for France

Husband's education					
Wife's level of education	Elementary not completed	Elementary completed	Lower secondary	Higher secondary	Post secondary
Elementary not completed	2.59	2.60	2.39	1.82	<u>b/</u>
Elementary completed	2.04	1.99	2.04	1.81	1.59 <u>a/</u>
Lower secondary	2.41 <u>a/</u>	1.85	1.89	1.78	1.86 <u>a/</u>
Higher secondary	1.78 <u>a/</u>	1.73	1.70	1.87	2.11
Post secondary	<u>b/</u>	1.76 <u>a/</u>	1.59 <u>a/</u>	1.93 <u>a/</u>	1.94

a/ Sample size 10 to 49.

b/ Sample size less than 10.

Table 11. Effect of type of current residence and husband's socio-occupational status combined on achieved fertility, adjusted for marriage duration, age at marriage and wife's education, for Italy

Type of current residence	Husband's socio-occupational status		
	Agricultural	Manual	Non-manual
Rural	2.15	1.84	2.06
Urban	2.04	1.92	1.92

Table 12. Effect of wife's level of education and wife's work history combined on achieved fertility, adjusted for marriage duration, age at marriage and residence

Country and work history	Wife's level of education				
	Elementary not completed	Elementary completed	Lower secondary	Higher secondary	Post secondary
France					
Currently working	1.77	1.63	1.61	1.68	1.75
Not working, worked since marriage	2.44	2.29	2.09	2.06	2.17*
Worked before marriage or never	2.32	2.31	2.58	2.17	1.80*
Hungary					
Currently working	-----1.87-----		1.41	1.32	1.39
Not working, worked since marriage	-----2.52-----		1.95	1.91	1.91
Worked before marriage or never	-----2.89-----		1.83	2.04*	1.44*
Italy					
Currently working	2.23	1.70	1.57	1.69	2.02
Not working, worked since marriage	2.75	1.98	1.70	1.90	1.95*
Worked before marriage or never	2.78	2.14	1.95	1.74	2.01*

D. The World Fertility Survey's contribution to the understanding of fertility levels and trends

World Fertility Survey*

INTRODUCTION

The principal aim of the World Fertility Survey (WFS) is to assist participating countries in describing and interpreting their own fertility. This aim finds expression in the publication of country reports, containing a detailed set of tabulations with an accompanying text, and in subsequent country-specific analyses, focusing on specific topics. So far, 30 country reports have been published or are in press and over 300 further analyses, most of them carried out by nationals of participating countries, have been completed or are in progress.

The contribution of the WFS programme to an understanding of fertility, however, lies as much in its cross-national character as in the isolated results for particular countries. Its unique advantage over previous research stems from the ability to measure relationships over a very broad range of societies, at widely different stages of development with sharply contrasting cultural backgrounds. It is on this comparative aspect that we concentrate in this paper despite the fact that, in contrast to national analyses, comparative studies are at an early stage and that it will be many years before the vast potential represented by the total of 42 developing-country surveys is fully exploited.

This account of findings draws heavily on the WFS cross-national summary series, the relevant issues of which are listed at the back of this paper, and on country reports whose publication details may be found in WFS annual reports. Other principal sources include recent summaries of findings prepared by Cleland and Chidambaram (December 1981), and by Lightbourne, Singh and Green (March 1982). The paper is divided into three main sections covering the proximate determinants of fertility, the socio-economic correlates of fertility and finally a brief discussion of infant and child mortality and its relation to fertility.

* International Statistical Institute, London.

As background, it is useful to outline the questionnaire content on which this study of these phenomena will be based. The WFS core questionnaire includes complete histories of pregnancies and of marital unions, a section on knowledge, ever-use and current use of contraception and questions on length of breast-feeding for the last and penultimate child. Most Latin American and many Asian surveys, following WFS recommendations on modular material, have supplemented the core items on contraception with additional details on contraceptive use in the open and last closed birth intervals and on contraceptive supply factors such as proximity to the nearest source. In Africa, the information sought on these items is less relevant because of the generally low levels of anti-natal practice. Instead, nearly all participating countries in this region have incorporated in their questionnaires the pioneering WFS module "Factors Other Than Contraception Affecting Fertility (FOTCAF)". Its most important feature is the additional information it provides on traditional birth-spacing mechanisms such as post-partum abstinence and amenorrhoea, the timing of supplementary infant feeding and temporary spousal separations.

PROXIMATE DETERMINANTS OF FERTILITY

Introduction

There is now evidence to show conclusively that fertility is declining in various regions of the developing world, while in other regions it appears to have remained stable over the past 20 years. This evidence from the WFS is presented in table 1, showing the number of births to each woman as of age 35 by five-year periods, beginning with the period 15-19 years before the survey. The information is based on the birth history data collected about each of a woman's births in turn. Detailed evaluations of WFS data show that omission of births is not usually a serious problem although some misdating of births has been detected. In any case the WFS surveys, using the birth history technique, have generally achieved much better coverage of births than censuses or other surveys (Chidambaram, Cleland and Verma, 1980).

According to the data shown in table 1, fertility was stable over the 20 years before the WFS surveys in three countries - Lesotho, Nepal and Senegal. Furthermore, it is unlikely that any fertility decline occurred in four countries where the data on fertility trends are of uncertain quality or have not yet been evaluated - Bangladesh, Kenya, Sudan (North) and Syrian Arab Republic. In most WFS Asian countries, fertility began to decline in the late 1950s - i.e., the rates dropped steadily from 15-19 to 0-4 years before their surveys. The exceptions are Indonesia, Jordan and Pakistan, where marked fertility declines began only in the late 1960s, 5-9 years before their surveys. A few Latin American countries - Colombia, Costa Rica, Paraguay and Peru - began well-established fertility declines in the late 1950s or early 1960s. The decline began in the mid-1960s in other countries of that region - the Dominican Republic, Guyana, Mexico and Panama.

An understanding of these fertility trends can be gleaned from a study of the so-called "proximate" determinants of fertility. In this paper attention is concentrated on nuptiality, sexual exposure within marriage, the post-partum variables of lactation and amenorrhoea, the availability and use of contraception, and models that relate proximate determinants to fertility. The decision to exclude some other proximate determinants such as induced abortion, other foetal mortality and menopause is based on the view that major advances in understanding in these areas are unlikely to emerge from large-scale survey undertakings.

Nuptiality

Data from countries included in table 2 show a clear trend towards later ages at first union. Current status data (not shown) demonstrate even more pronounced trends. A tendency towards postponement of first birth is also apparent in most WFS Latin American and Asian countries, though it is less pronounced than the trends in marriage. Shortening first birth intervals, due to premarital conceptions and the declining impact of adolescent sub-fecundity, undoubtedly account for much of this dilution of the effect of marriage postponement on the start of reproductive life. There is also some evidence from evaluations of data quality of greater misreporting of marriage dates than of dates of first births, particularly by older women, which affects the observed relationship between marriage and maternity in some countries (O'Muircheartaigh and Marckwardt, 1980).

Asian countries appear to have experienced a somewhat steeper increase than Latin American countries but, in both regions, first unions take place at appreciably older ages among urban and better educated women than among the rural and less educated. Changing socio-economic composition, per se, however, cannot account for the trends towards postponement of marriage in these two regions; the amount of recent change is not related systematically to the residential or educational background of the women. In Africa, the evidence so far is scanty.

The contribution of the WFS to an understanding of the relationship between age at first union and subsequent fertility is substantial. It is clear from the 30 published country reports and a more detailed analysis of only nine surveys (Caldwell, McDonald and Ruzicka, 1980) that a rise in age at marriage up to at least 18 years, and perhaps to 20 years, does not subtract from the quantum of fertility. Indeed, in several surveys, women marrying at very young ages report lower completed fertility than those marrying at intermediate ages, though it is not yet clear whether this can be attributed to some such mechanism as impaired fecundity or merely reflects errors in the data. From the ages of 21 or 22, further postponement of marriage does appreciably reduce cumulative fertility.

A second major aspect of the nuptiality-fertility relationship is the effect of marital dissolution on fertility. The incidence of dissolution varies enormously across countries, with a range in the percentage of first

Fiji and Malaysia. A cursory glance at these cross-national differences suggests that differing educational and rural-urban compositions of populations may account for some but not all cross-national variations in Latin America and the Caribbean but for much less in Asia. The results for the Republic of Korea and Sri Lanka are of particular significance because they demonstrate that prolonged breastfeeding is not necessarily incompatible with high levels of education or with economic modernization.

Analysis of data on the current status of breast-feeding (i.e., measures based on proportions of infants still unweaned at the time of survey) reveals a moderate negative relationship between duration and maternal age and pronounced associations with mother's education, location of work and place of residence. For nearly all 28 countries included in the cross-national summary on this topic, there is a sharp drop in length of lactation among mothers with seven or more years of schooling, but differences between those with no schooling, one to three years and four to six years are often more modest. The strong confirmation of an association between working away from home and breast-feeding habits is also of major interest. These differentials imply a widespread trend towards earlier weaning which is of major demographic importance.

The broad impact of breast-feeding on amenorrhoea and hence on birth interval length is well established, and further elucidation of this relationship will be possible with FOTCAF data which, in addition to information on amenorrhoea, include information on the timing of the supplementation of breast-milk with other liquid or solid food. Preliminary comparisons for seven populations between observed durations of amenorrhoea (based on current status information) and those estimated from the survey data on breast-feeding by means of Bongaarts' exponential formula (Bongaarts, 1978 and 1981) indicate a reasonably close correspondence, except for Bangladesh and Lesotho, where the observed values are much lower. Replication of this type of work on subpopulations and on new data sets represents a major opportunity for empirical testing and development of model specifications.

Knowledge, availability and use of contraceptives

A major focus of the WFS programme has been the collection and publication of data on contraceptive knowledge and use. Once again, one of the important contributions of the WFS has been the collection of standardized, comparable data on knowledge and use across a range of countries in the developing world (see table 4).

With respect to knowledge, the WFS national surveys provide information on contraceptive "awareness" rather than on the extent to which women actually know how to use specific methods. Contraceptive awareness includes both the methods mentioned spontaneously and those recognized after an interviewer's probe. From among the 29 countries for which data are at hand, in only four - Lesotho, Nepal, Senegal and Sudan (North) - were there large proportions of

currently married, fecund women who had not heard of a single contraceptive method, ranging from 34 to 77 per cent. The percentage ranged from 10 to 24 per cent in seven more countries - Bangladesh, Haiti, Indonesia, Pakistan, Peru, Syrian Arab Republic and Turkey. In the remaining 18 countries, fewer than 10 per cent of women were unaware of all methods. Among women who had heard of at least one contraceptive method, the overwhelming majority in all countries (except Senegal) mentioned at least one efficient or modern contraceptive method. Modern methods are defined to include oral contraceptives, injectables, intrauterine device (IUD), female barrier methods, condom, and female and male sterilization.

The data on contraceptive use refer once again to currently married, fecund women. This category includes women who themselves, or whose husbands, have been sterilized. Across the same 29 countries, about one third of such women were using some form of contraception at the time of review. The level of use ranged from 3 per cent in Nepal to 71 per cent in Costa Rica. There are fairly pronounced regional differences. The figures are highest in Latin America and the Caribbean, where the unweighted average is 44 per cent, with proportions of 40 per cent and more in seven countries and 20 to 39 per cent in the other five. In Asia and the Pacific - with a regional average of 28 per cent - the proportions vary widely, from 46 per cent in Fiji down to 10 per cent or lower in Bangladesh, Nepal and Pakistan. The three Middle Eastern countries have moderate proportions of between 23 and 45 per cent, while the four African countries have low proportions of just 4 to 8 per cent.

Despite widespread awareness of efficient, modern contraceptive methods, one third of women using contraception at the time of interview in the 29 countries were using inefficient or traditional methods. The proportion of contraceptors using inefficient methods was highest in the African and Middle East countries (46 per cent and 40 per cent respectively) and lowest in the Asian-Pacific and Latin American-Caribbean countries (25 and 27 per cent, respectively). The figure exceeded 40 per cent in seven countries - Haiti, Lesotho, Peru, Philippines, Senegal, Sri Lanka and Turkey. Since inefficient methods are generally more difficult to use, their use suggests a strong commitment to postpone or stop childbearing coupled with either religious beliefs opposed to use of modern methods or, more likely, to lack of access to such methods.

A key issue for policy-makers wanting to influence fertility trends is the extent to which contraceptive use is affected by the accessibility of family planning services. Some answers are not available from data on current contraceptive use and from questions asked in various surveys about women's knowledge of sources of family planning supplies. In general, it is found that with respect to the current use of any contraceptive method, fertility preferences (i.e., whether women want another child or not) are a more important factor than is differential access to a family planning outlet, in both urban and rural areas (Rodríguez, 1979; and Chidambaram and Mastropoalo, 1980). Thus demand is more important than supply, except where the perceived lack of supply smothered demand, as may occur in isolated rural areas.

However, when availability is related to the use of specific methods, a stronger association emerges. Accessibility is particularly important in relation to the use of methods requiring a regular source of supplies, such as the pill and condom. And as may be expected, it is entirely unrelated to the use of methods such as rhythm, sterilization or the IUD. Surprisingly, rural women are more likely to use the pill or condom than urban women if they live near a source of supplies. The association between accessibility and possession of contraceptives in the home is also stronger in rural than in urban areas. From these findings it may be concluded that the use of supply methods would increase in developing countries, especially in rural areas, if more convenient family planning services were made available.

The proximate determinants and the use of models

Mention has already been made of the use of models to measure the relative impact of the various proximate determinants of fertility. Perhaps, the best known of these models is that developed and subsequently refined by Bongaarts (1978, 1980, 1981). He has assembled evidence that cross-national variations in total fertility can be largely attributed to variations in the following five proximate determinants: proportions currently married; contraceptive use; contraceptive effectiveness; induced abortion; and post-partum infecundability. In the absence of the fertility-inhibiting effects of all five determinants, the potential fertility of populations varies narrowly round an average of 15.3 births. The main empirical validation of the underlying assumptions and precise specifications of the model was based on data from 12 developing countries (including data from seven WFS surveys), for 8 developed countries and 10 historical populations. Despite the necessity of assuming induced abortion to be absent in all but one of the developing countries, an astonishingly close correspondence between observed and model estimates of the total fertility rate was achieved for all three population groups.

In a more recent application of the Bongaarts model to 28 WFS data sets, in which the effect of induced abortion was again set to zero, a different picture emerges (Cleland and Chidambaram, 1981). For 25 of the 28 countries, the model predicts higher total fertility rates than those calculated directly from the birth history data; in many cases the predicted values are appreciably higher. No doubt, a part of these differences can be explained away by defects in the data. But the differences are so large and systematic as to call into doubt the adequacy of a five-factor model. Specifically, temporary separations of couples appears to be a factor holding down fertility in Lesotho and Nepal. Post-partum abstinence is a phenomenon of importance in many societies. A recent report on an analysis of Kenyan WFS data concludes that secondary infertility is higher and fecundability lower than assumed in the model (Mosley, Werner and Becker, 1981).

These findings suggest that national variations in fertility levels cannot be attributed to variations in just five proximate determinants. The absence of sexual relations in many contexts, whether due to temporary

separations or other causes, is an important factor not taken into consideration. But even though the Bongaarts model provides an imperfect fit, its usefulness in converting proximate determinants to a common fertility-reducing scale is indisputable. The greater fertility-inhibiting impact of lactational amenorrhoea than of contraception in Africa and most of Asia, but the converse situation in most Latin American countries, can be clearly demonstrated. Such knowledge is useful for understanding socio-economic differentials and trends in fertility and is of great relevance for the formulation of population policies.

Another model which overcomes some of the problems inherent in the Bongaarts model was developed over a decade ago at the Latin American Demographic Centre (CELADE) to measure the effectiveness of family planning campaigns (Gaslonde and Bocaz, 1970; Gaslonde and Carrasco, 1973). It takes as input data collected in a questionnaire module entitled "Sexual history in the last year". These data include months of pregnancy and whether the pregnancy was immediately preceded by contraceptive use; months of absence of sexual intercourse, and whether due to celibacy, temporary spousal absence, separation, illness or other; and finally, months of contraceptive non-use or use, with use broken down by method. The data are collected in a retrospective interview and recorded on a month-by-month basis for the 12 months preceding and the month of interview. The module has been used by CELADE in several Latin American surveys, and has found its way into two WFS national surveys. The results presented below are based on the Venezuelan survey (Gaslonde and Carrasco, 1982).

The Gaslonde model starts out by defining a theoretical pregnancy rate, equivalent to the observed pregnancy rate for women having regular sexual relations without using any means of control (i.e., contraception). This rate is successively reduced by the absence of sexual relations, contraceptive practice and foetal mortality to arrive at the observed fertility rate. Thus.

$$f = p(1-r_{ASR}) (1-r_{CP}) (1-r_{FM}).$$

In Venezuela it was found that the values of the three parenthesized expressions were respectively 0.50, 0.57 and 0.88, indicating that the theoretical pregnancy rate was reduced by 50 per cent because of absence of sexual relations (mostly celibacy on the part of younger women), the resulting rate a further 43 per cent thanks to contraceptive use, and finally, this resulting rate a further 12 per cent due to foetal mortality. Starting with a theoretical pregnancy rate of 563, one arrives at the observed general fertility rate of 140.

One of the strengths of the Gaslonde model is that it is entirely data-based. Another advantage is that each of the three reduction factors can be further decomposed: into reasons for absence of sexual relations; into method-specific contraceptive efficacy; and into types of foetal mortality. For example, in the case of Venezuela the decomposition of absence of sexual relations is as follows: celibacy, 77 per cent; separation or temporary absence, 15 per cent; and illness or other, 8 per cent. The model thus

provides insight into precisely those factors that are overlooked in the five-factor Bongaarts model. The Gaslonde model is described in some detail here because only recently have details of it become available in an English-language publication (Gaslonde and Carrasco, 1982).

Work is currently underway at WFS headquarters on the perfection of a model that combines the best features of the Bongaarts and Gaslonde approaches. Estimates from commonly available data are made for the effects of post-partum amenorrhoea, lactational amenorrhoea and method-specific contraceptive efficacy. These values are then plugged into an exposure framework that includes pregnancy, celibacy, separation, lactation and contraception, much along the lines of the Gaslonde model. Experimentation is being done with decompositions of four types: multiplicative, additive, combined multiplicative and additive and, finally, linear regressive. Once perfected, the model should find application to a wide variety of WFS and other data sets, particularly those containing data of the kind collected in the FOTCAF module.

SOCIO-ECONOMIC CORRELATES OF FERTILITY

Introduction

The influence of social and economic characteristics on the number of children couples have is an important area of research because of its implications for government policies and programmes. While the variety of characteristics on which data have been collected by the WFS across all participating countries is small, nevertheless they do reflect personal and environmental conditions that are likely to influence fertility. Attention here will be directed to three well-known correlates of fertility: women's education, urban-rural residence and women's employment. Although the study of such correlates has been in the mainstream of demographic enquiry for decades now, the wealth of data newly available through the WFS should provide information of great interest.

It must be kept in mind that social and environmental characteristics affect fertility through their operation on the proximate determinants of fertility, the so-called intermediate variables. While this aspect is sometimes neglected in the necessarily brief discussion which follows, it is the focus of urgent and systematic work currently underway at WFS headquarters.

Women's education

Fertility differentials by education and place of residence for ever-married women aged 30-34 are shown in table 5. In general, the average number of children per woman declines as the woman's level of education

increases. Differences in fertility by level of education can be seen in countries with little or no fertility decline, although they are greater in countries that have had substantial fertility declines. For example, in Colombia, where fertility has declined markedly, women with no education have an average of 5.9 children - 2.8 more than those with at least secondary education. In Kenya the difference is only 0.6 children. The difference between the lowest and highest education groups is greatest in the WFS Latin American countries, generally on the order of 2 to 3 children. In the other three regions, the differences generally range from half a child to 2 children per woman. Across all countries, women who had attended secondary school had an average of 2.2 to 3.5 children each, with a few notable exceptions. In contrast, women with no education generally had an average of 5-6 children in the African and Latin American countries and 4-5 children in the Asian and Pacific countries.

A reversal in the pattern of declining fertility as education increases can be observed in five countries: Indonesia, Kenya, Pakistan, Philippines and Sudan (North). The explanation for this may be that women with a few years of primary schooling are more likely to discontinue traditional practices such as breast-feeding and abstinence following a birth, which serve to decrease fertility by increasing the interval between births. However, it is likely that overall completed fertility will not differ greatly between the two groups, since women with a primary-level education are more likely than uneducated women to limit their fertility after the age of 35.

The most extensive comparative analysis so far completed of socio-economic determinants of fertility found that when the effects of area of residence and the socio-economic status of husbands were controlled, the effect of wives' education was considerably attenuated. This implies that women's education partly reflects the overall socio-economic status of the couple. Significant education effects remained for about one half of the countries studied, however, indicating that women's education does have some independent influence on fertility (Rodriguez and Cleland, 1980).

Urban-rural residence

Differences in fertility according to urban-rural residence are not as large as those by educational level in the countries studied, perhaps in part because of the dichotomous nature of the split. The differential is more pronounced and universal in Latin America, where ever-married urban women aged 30-34 have an average of one child less than similar rural women (see table 5). In Africa, Asia and the Pacific, the differences are smaller and less widespread, with urban women generally having about half a child less than rural women. These regional variations can be explained largely in terms of differential use of contraception and breast-feeding.

Urban residence makes almost no difference in Bangladesh, Indonesia, Lesotho, Nepal, Senegal, Sri Lanka and Sudan (North). Possible explanations for this are that there is very little qualitative difference between urban

and rural areas; that urban growth has been very recent in these countries; that the difference between urban and rural areas has evened out after large fertility declines; or that a difference will emerge after women have completed their families, by age 50. In Pakistan, where urban women have had higher fertility than women living in rural areas, the likely explanation lies in the breakdown of traditional practices such as breast-feeding and post-partum abstinence in urban areas.

When education and employment of both husbands and wives are controlled, the effect of urban-rural residence on recent marital fertility is halved. This suggests that only about half of the observed urban-rural differential is due to the characteristics of urban life itself, such as the higher net cost of children, selectivity of urban migrants, the weakening of traditional pronatalist values, and better access to means of fertility control (Rodriguez and Cleland, 1980).

Women's employment

In general, married women who work outside the home have smaller families than women who do not. Those who work for non-familial employers have the lowest fertility, followed by women employed by their family and those who are self-employed; non-employed women have the highest fertility. Non-familial employment has a stronger association with recent marital fertility in the WFS Latin American countries than it has in countries in the other regions. Even after controlling for residence, wife's education and husband's socio-economic status, significant differences by employment status persist in most countries (Rodriguez and Cleland, 1980).

The causal direction of the employment-fertility relationship has been called into question by an analysis of WFS data for the same set of countries by the United Nations Population Division (1981) that found that contraceptive use was only slightly higher among employed women than among those who did not work. If women working outside the home are not more likely to use contraception than non-working women, their lower fertility may not be entirely voluntary; that is, employment may be the result of infertility or smaller family size rather than vice-versa.

The possibly contradictory results from the two foregoing comparative analyses on the same 20 countries are troubling. Hopes that more detailed country-specific studies might provide clearer-cut results on the employment-fertility relationship are as yet largely unfulfilled. Close to a dozen studies have been completed, yielding a mixture of findings defying simple generalization. The best of the country studies have taken care to clearly distinguish between different labour markets, on the one hand, and to specify the timing of work in terms of the women's life cycle, on the other (Gómez, 1981; Schoemaker, 1981; Suárez, 1981; summarized in Conning and Marckwardt, 1982). This could serve as a useful lesson for future comparative work.

Community characteristics

It has long been argued that demographic behaviour, and particularly demographic change, cannot be understood in isolation from the context in which they take place. Of particular importance is the interaction or relation between the individual and the group characteristics (Freedman, 1974). The WFS has encouraged participating countries to make use of a so-called "community variables" module to enrich the types of analyses which may be undertaken to explain fertility and related behaviour. The module has been incorporated into 16 of the 42 developing-country surveys. The questionnaires usually consist largely of items on the relative accessibility of facilities such as health clinics, family planning clinics, schools and financial institutions, and measures of the presence in the community of sanitation and water services, availability of electric power and the ease of communication with the outside world. Items on the nature of economic activity have also been included in some of the questionnaires. In most countries, the community survey has been limited to rural areas.

The results of early efforts to relate community characteristics to fertility-related behaviour, with data from WFS surveys in Bangladesh, Malaysia and Pakistan were disappointing (Chidambaram, 1980). The absence of positive findings in these studies cannot be attributed to a lack of methodological sophistication. To what it may be attributed is still a mystery. One observer has commented that "...there is practically nothing in the WFS module that allows for a reasonable characterization of the social context...", and goes on to suggest the necessity of gathering data on the organizational and structural aspects of social and economic life (Miró, 1980). While the suggestion may have merit, such an undertaking would be clearly outside the scope of an ordinary household sample survey.

Fortunately, more recent work still unpublished has been able to show definite community effects on individual fertility-related behaviour, principally contraceptive use, in such diverse settings as Indonesia, Peru, the Philippines, Mexico and Thailand. Some of these same studies have shown the usefulness of aggregating individual or household characteristics, such as educational level, ever-use of contraception or household amenities to higher levels such as the primary sampling unit or the province, and then using these aggregated indices in the explanation of individual human behaviour (Casterline, 1981). These successes have served to revive interest in community data at the WFS.

As a result, plans are underway to sponsor a three-month workshop in 1983 on "community effects on infant and child mortality", with participants from a half-dozen developing countries. This will be followed by a one-week seminar with invited experts. The objectives of the seminar will be: (a) to present results from research on community effects on demographic behaviour; (b) to assess the WFS community module; and (c) to make recommendations for the design of future data collection and analysis.

INFANT AND CHILD MORTALITY

Introduction

As indicated by its name, the World Fertility Survey was not primarily intended as a mortality survey. Yet results from the WFS probably constitute the richest body of data on infant and child mortality currently available for the developing world. Much of the potential of these data has only recently begun to be exploited and much remains to be done. The source of the data is the detailed birth history contained in each of the surveys. Here the attempt is made to get reliable information on the time of occurrence of each live birth, its sex, whether still alive and, if dead, the time which the child survived. The following paragraphs summarize briefly the results of recent analyses of levels and trends of infant and child mortality in 29 developing countries contained in the relevant cross-national summary and other sources (Hobcraft, 1981, Hobcraft; McDonald and Rutstein, 1982). In a final section, some work on the relationship of infant mortality to fertility is reviewed.

The levels of infant and child mortality

Table 6 presents the recent levels of infant and child mortality for the five-year period prior to each survey. The variation of mortality is very great: Panama, in this study the country with the lowest levels of mortality, has less than one of 20 of its children die before reaching age five years, compared with one out of four for Senegal, a variation of more than five to one. In general, and not unexpectedly, it is the poorest WFS countries in Africa and Asia that present the highest rates. The rates for the Caribbean countries, Haiti excepted, are among the lowest in the developing world.

The results from the WFS data indicate higher levels of infant and child mortality in most countries than had been indicated previously. A comparison with rates given by the 1978 United Nations Demographic Yearbook show that among the 18 countries for which comparisons are possible, in 17 the WFS figures are higher, sometime by as much as 50 per cent or more; the figures published in the Yearbook come from national registration systems, which are often deficient.

Trends in infant and child mortality

The WFS data permit the calculation of infant and child mortality rates for the past. However, there are three basic limitations to the use of these rates for determination of time trends. The first is the triangular nature of the data: since only women up to age 49 years at the time of the survey were interviewed, information about the mortality of children is limited to those

born to progressively younger mothers as the period of interest is further removed in the past. Secondly, the age of the mother at birth affects the child's chances of survival and, coupled with the forementioned truncation, could distort the interpretation of time trends. Thirdly, data on children born to mothers less than 20 years old at the time may suffer from volitional omission. Consequently, the examination of time trends in table 7 is restricted to children born to mothers aged 20-29 years at birth and for periods up to 19 years prior to the survey.

In all 29 countries examined, infant and child mortality declined over time, in most cases substantially. The greatest amount of change in under-five mortality occurred in Jordan and Turkey, where the decreases mean that over 10 per cent more children are reaching their fifth birthday than 15 to 19 years ago. The least change occurred in Paraguay and the Philippines, the former showing a small and erratic change over time and the latter practically no change. Generally speaking, the declines in child mortality have greatly outstripped those in infant mortality, both on an absolute basis and on a relative basis. This is undoubtedly attributable to a greater control over exogenous causes of death, such as disease, than over endogenous causes, such as birth defects.

The infant mortality-fertility relationship

A quick comparison of figures on fertility with those on infant and child mortality for the 29 developing countries reveals a strong positive correlation between the two sets. Countries with relatively lower fertility generally have relatively low infant mortality, while the few countries with exceptionally high infant mortality rates also have high fertility. It is generally assumed that the positive correlation between fertility and mortality, at both aggregate and individual levels, is a reflection to some extent of common antecedent variables, or conditions. However, at the individual level fertility can affect mortality directly, and vice-versa, independently of common antecedents. The intuitively more obvious of the two causal links is that of fertility to mortality: high fertility brings about high infant mortality because of the close spacing of births and the resulting lesser amount of attention that a mother can devote to any one of her children.

The less obvious link is that of the effect of infant mortality on fertility. Briefly, mortality can increase fertility in three ways. First, there is a biological effect, exercised through the cutting off of lactation and the consequent shortening of the birth interval to the following child. Secondly, there maybe a replacement effect, whereby women consciously try to replace a child that had died. Thirdly, an unconscious protection or insurance effect may operate, whereby women have more children in areas of high mortality because they expect that one or more of their children will die.

The study of the effect of infant and child mortality on fertility was very much in vogue in the early 1970s, the subject of numerous learned articles and of an international seminar held in Bangkok in 1975. Since then,

interest seems to have waned, ironically just as the richest source of material with which to study this topic was becoming available. To date there has been but one attempt that we know of to study the topic using WFS data. It seems worthwhile here to briefly outline the findings of this study, dealing with Colombia, as an illustration of the uses to which WFS data may be put in this area. The analysis was carried out by Edgar Baldi6n (1981) and is summarized in Conning and Marckwardt (1982).

The biological effect is studied by examining the length of the last closed birth interval among women who did not use contraception in that interval. There are three principal findings concerning this effect. First, the death of a child prior to completing six months accelerates the birth of the following child by about 10 months - a vigorous response to infant mortality. Secondly, despite this response, the overall effect it might have on general fertility levels is almost nil. Thirdly, it would appear that the duration of lactation has a greater impact on fertility levels than does infant mortality.

The replacement effect is studied by looking at the cumulative fertility of women disposed to using contraception, whose last child was wanted and has survived, and who have reached their desired family size. First, among the population susceptible to the operation of this effect, i.e., planners, there appears to be almost 100 per cent replacement of children who die, and this elevates total fertility by about 10 per cent in this population. Secondly, inasmuch as this population has in the past represented only a small fraction of the total population, the impact of the replacement effect on the fertility rate of Colombia has been small. Thirdly, given the growing diffusion of family planning technology, future reductions in child mortality can be expected to have an impact in reducing fertility levels.

Finally, the protection effect is studied through an examination of the desired family size of fecund women who have not experienced the death of a child and who have knowledge of and access to contraceptives, living in environments of varying levels of child mortality. The protection effect appears not to be operative in Colombia. It was expected that desired family size would correlate positively with infant and child mortality rates across regions, but this did not prove to be the case. (Had the sample been larger, other tests of the effect could have been tried, such as completed family size.)

One policy implication of the findings in this paper is that if reductions in infant and child mortality can be brought about, this will have a concomitant effect on fertility levels. It is demonstrable that a reduction of 50 per cent in current child mortality rates will, in the future, imply a yearly reduction of 40,000 births in Colombia, given current annual fertility rates. If births are viewed as a cost to the State, it is in the national interest to achieve this reduction.

It is to be hoped that similar studies will be undertaken with data sets of other countries participating in the WFS programme. The opportunity is available to clarify, in a comparative context, the effect of infant mortality on fertility.

CONCLUSION

In view of space constraints, this paper has dwelt largely on the direct contribution of WFS surveys to an understanding of fertility levels and trends. This is possible because the detailed histories collected in WFS surveys present a unique source of data on trends as well as recent levels. Yet, it is important to remember that the WFS has been a one-shot effort and only sometimes has it been the first detailed fertility survey in a country. In many instances, detailed earlier census and survey results have provided benchmarks against which to evaluate results from the WFS surveys in detailed comparisons. Perhaps surprisingly the WFS survey results usually survive such close scrutiny rather well and more frequently point up problems with earlier data sets. However, especially in countries that have already carried out a series of fertility surveys, further insights can be obtained from comparative analysis. A recent study in Costa Rica on three fertility surveys illustrates the advantages of such comparisons in enhancing an understanding of fertility change (Rodriguez, Rosero and Gómez, forthcoming).

Equally, the period subsequent to a country's participation in the WFS is highly likely to produce further detailed fertility surveys. In several countries rather less detailed contraceptive prevalence surveys have taken place since the WFS inquiry. At least two countries have repeated a detailed fertility survey very similar in content to their round of the WFS. No results are yet available for Pakistan, but a preliminary report on the two surveys for the Dominican Republic (Hobcraft and Rodriguez, 1982) has indicated the fruits of analysing two sets of overlapping history data. Perhaps the greatest contribution of the WFS to an understanding of fertility remains to come, as the WFS round becomes an early step in a chain of detailed surveys with overlapping histories which monitor demographic change through the demographic transition. The value of a long series of such surveys has been amply demonstrated for Taiwan, Province of China, a non-WFS area. It is to be hoped that such retruns will gradually become available from a large number of countries.

Table 1. Fertility trends over the 20 years before the surveys

(Births per woman by age 35 for five-year periods before the survey)

Region and country	Survey year	Years before the survey			
		15-19	10-14	5-9	0-4
<u>Africa</u>					
Kenya <u>a/</u>	1977/78	6.0	6.6	6.3	5.9
Lesotho	1977	4.0	4.2	4.1	4.3
Senegal	1978	5.7	5.6	5.5	5.5
Sudan (North) <u>a/</u>	1978/79	4.9	5.4	5.4	4.6
<u>Asia and Pacific</u>					
Bangladesh <u>a/</u>	1976	5.9	6.6	7.0	5.6
Fiji	1974	5.5	5.3	4.2	3.5
Indonesia	1976	4.6	4.6	4.4	3.9
Malaysia	1974	5.2	4.9	4.3	3.7
Nepal	1976	4.7	4.7	4.8	4.8
Pakistan	1975	5.6	5.6	5.6	5.1
Philippines	1978	5.1	4.9	4.6	3.8
Republic of Korea	1974	4.4	4.2	3.7	3.6
Sri Lanka	1975	4.6	4.3	3.7	2.9
Thailand	1975	5.0	4.8	4.4	3.4
<u>Latin America and Caribbean</u>					
Colombia	1976	5.6	5.3	4.6	3.6
Costa Rica	1976	5.5	5.4	4.0	3.3
Dominican Republic	1975	5.5	6.0	5.5	4.6
Guyana	1975	5.7	5.6	5.0	4.2
Haiti	1977	4.5	4.2	3.9	3.8
Jamaica	1975/76	4.9	5.3	4.8	4.1
Mexico	1976/77	5.5	5.5	5.3	4.8
Panama	1975/76	4.8	4.8	4.5	3.8
Paraguay	1979	4.7	4.4	4.1	3.8
Peru	1977/78	5.2	5.0	4.7	4.1
Trinidad & Tobago <u>b/</u>	1977	5.1	4.4	3.3	2.8
Venezuela <u>b/</u>	1977	...(4.0) <u>c/</u>	5.0(3.6) <u>c/</u>	4.5(3.3) <u>c/</u>	3.7(2.8) <u>c/</u>
<u>Middle East</u>					
Jordan	1976	6.7	6.9	6.5	5.8
Syrian Arab Republic <u>a/</u>	1978	5.7	6.1	5.6	5.4

a/ Either the data on trends have defects or the data have not yet been evaluated.

b/ The 45-49 age group was not interviewed, therefore cumulative fertility up to age 35 is not available for 15-19 years before survey. Comparable data are shown for periods up to 10-14 years before survey, and cumulation up to age 30 is given for all periods.

c/ Fertility rates cumulated to age 30.

Table 2. Median age at marriage of women in current age groups
25-29 and 45-49

Region and country	25-29	45-49	Difference
<u>Africa</u>			
Kenya	18.0	18.4	-0.4
Lesotho	18.9	18.3	+0.6
Senegal	16.3	16.1	+0.2
<u>Asia and Pacific</u>			
Bangladesh	13.1	12.4	+0.7
Fiji	19.5	17.8	+1.7
Indonesia	16.1	15.6	+0.5
Malaysia	20.9	16.9	+4.0
Nepal	15.2	15.8	-0.6
Pakistan	16.5	15.3	+1.2
Philippines	21.8	20.5	+1.3
Republic of Korea	22.8	17.1	+5.7
Sri Lanka	23.0	18.2	+4.8
Thailand	20.4	19.8	+0.6
<u>Latin America and Caribbean</u>			
Colombia	20.7	20.9	-0.2
Costa Rica	21.7	21.8	-0.1
Dominican Republic	17.9	18.8	-0.9
Guyana	18.4	17.9	+0.5
Haiti	19.8	21.0	-1.2
Jamaica	17.8	20.2	-2.4
Mexico	20.1	20.0	+0.1
Panama	19.9	18.9	+1.0
Paraguay	20.6	20.3	+0.3
Peru	20.6	20.3	+0.3
Trinidad & Tobago	19.2	17.8	+1.4
Venezuela	19.9	18.9	+1.0
<u>Middle East</u>			
Jordan	18.3	16.7	+1.6
Syrian Arab Republic	19.3	18.7	+0.6

Table 3. Amount and duration of breast-feeding

Region and country	Percentage of women who had ever breast-fed	Median length of breast-feeding (months)
<u>Africa</u>		
Kenya	98	15.4
Lesotho	96	20.5
Senegal	98	19.1
Sudan (North)	98	14.5
<u>Asia and Pacific</u>		
Bangladesh	98	30.7
Fiji	86	9.2
Indonesia	97	22.2
Malaysia	73	2.6
Nepal	98	23.6
Pakistan	95	19.2
Philippines	86	12.7
Republic of Korea	93	16.6
Sri Lanka	95	20.8
Thailand	92	18.9
<u>Latin America and Caribbean</u>		
Colombia	90	6.8
Costa Rica	74	1.8
Dominican Republic	89	7.2
Guyana	88	4.5
Haiti	97	15.0
Jamaica	92	6.0
Mexico	80	6.7
Panama	79	3.7
Paraguay	92	11.8
Peru	93	12.9
Trinidad & Tobago	80	6.3
Venezuela	82	3.0
<u>Middle East</u>		
Jordan	92	8.5
Syrian Arab Republic	96	9.2

Table 4. Contraceptive awareness and use among currently married, fecund women (Percentage)

Region and country	Unaware of any method	Aware only of inefficient methods	Aware of one or more efficient methods	Currently using a contraceptive
<u>Africa</u>				
Kenya	9	3	88	8
Lesotho	34	5	61	7
Senegal	40	40	20	4
Sudan (North)	49	1	50	5
<u>Asia and Pacific</u>				
Bangladesh	16	3	81	10
Fiji	0	0	100	46
Indonesia	18	1	81	33
Malaysia	6	2	92	36
Nepal	77	1	22	3
Pakistan <u>a/</u>	24	1	76	7
Philippines	5	0	95	39
Republic of Korea	1	0	99	35
Sri Lanka	7	1	92	35
Thailand	3	0	97	40
<u>Latin America and Caribbean</u>				
Colombia	4	1	95	46
Costa Rica <u>b/</u>	0	0	100	71
Dominican Republic	2	0	98	36
Guyana	4	0	96	35
Haiti	15	3	82	20
Jamaica	1	0	99	44
Mexico	9	0	90	35
Panama <u>b/</u>	1	0	99	58
Paraguay	4	1	95	41
Peru	17	4	79	36
Trinidad & Tobago	1	0	99	56
Venezuela <u>c/</u>	2	0	98	52
<u>Middle East</u>				
Jordan	3	0	97	29
Syrian Arab Republic	10	0	90	23
Turkey	10	2	88	45

Note: "Efficient" (modern) contraceptive methods include: pill, IUD, condom, injectables, female and male sterilization and "other female scientific methods" (foam, jelly, suppositories, cervical caps, diaphragm). "Inefficient" (traditional) methods include: douche, rhythm, withdrawal, abstinence and "country-specific methods" (e.g., charms, abdominal massage, herbal medicine, urination after intercourse).

a/ Pakistan data are based on spontaneous mentions. Other data also include responses to interviewer "probes".

b/ Women aged 20-49.

c/ Women aged 15-44.

Table 5. Fertility differentials by education and residence (Average number of children ever born per ever-married woman aged 30-34 at time of interview)

Region and country	Education <u>a/</u>			Residence	
	None	Primary	Secondary and higher	Rural	Urban
<u>Africa</u>					
Kenya	5.6	5.7	5.0	5.7	5.1
Lesotho	4.2 <u>b/</u>	4.0	2.9 <u>b/</u>	4.0	3.9
Senegal	5.4	5.1	3.1	5.3	5.2
Sudan (North) <u>c/</u>	4.9	5.8	3.9 <u>b/</u>	5.0	5.0
<u>Asia and Pacific</u>					
Bangladesh	5.7	5.7	4.9	5.7	5.6
Fiji	4.8	4.2	3.1	4.4	3.8
Indonesia	3.9	4.3	3.6	4.0	3.9
Malaysia	4.7	4.4	2.6	4.6	3.7
Nepal	4.1	3.5	3.5	4.1	4.0
Pakistan	5.0	5.2	3.9	4.8	5.4
Philippines	4.5	4.7	3.5	4.6	3.6
Republic of Korea	4.1	3.6	2.7	3.8	3.1
Sri Lanka	4.7	4.3	3.0	3.8	3.7
Thailand	4.8	3.9	2.2	4.1	3.0
<u>Latin America and Caribbean</u>					
Colombia	5.9	4.6	3.1	5.5	4.0
Costa Rica	5.1	4.3	2.6	4.9	3.1
Dominican Republic	5.4	5.0	2.5	5.5	4.3
Guyana	5.5	5.1	3.6	5.3	4.1
Haiti	3.6	3.4	2.5	3.6	3.3
Jamaica	- <u>d/</u>	4.5	2.2	4.8	3.5
Mexico	6.0	5.1	2.9	5.5	4.6
Panama	5.1	4.7	3.0	4.9	3.4
Paraguay	5.1	4.3	2.2	4.7	2.9
Peru	5.4	4.9	3.1	5.1	4.2
Trinidad & Tobago	- <u>d/</u>	3.8	2.2	3.9	2.9
Venezuela	5.8	4.5	2.5	5.9	3.8
<u>Middle East</u>					
Jordan	6.4	5.3	3.4	6.3	5.7
Syrian Arab Republic	5.6	5.2	4.1	5.6	4.9
Turkey <u>e/</u>	4.3	2.9	1.7	4.2	3.0

a/ "Primary" includes completed primary school and less; "Secondary and higher" includes all other educational levels attained.

b/ For 20-50 cases.

c/ Completed primary school is included in "Secondary and higher" category.

d/ Less than 20 cases.

e/ Age group is 25-34.

Table 6. Infant and child mortality rates in the five-year period prior to each survey

Region and country	Survey year	Infant mortality rate <u>a</u> /	Child mortality rate <u>b</u> /
<u>Africa</u>			
Kenya	1977/78	87	142
Lesotho	1977	126	174
Senegal	1978	112	262
Sudan (North)	1978/79	79	147
<u>Asia and Pacific</u>			
Bangladesh	1976	135	222
Fiji	1974	47	59
Indonesia	1976	95	159
Malaysia	1974	36	50
Nepal	1976	142	235
Pakistan	1975	139	207
Philippines	1978	58	93
Republic of Korea	1974	42	56
Sri Lanka	1975	60	86
Thailand	1975	65	91
<u>Latin America and Caribbean</u>			
Colombia	1976	70	108
Costa Rica	1976	53	61
Dominican Republic	1975	89	129
Guyana	1975	58	77
Haiti	1977	123	191
Jamaica	1975/76	43	56
Mexico	1976/77	72	96
Panama	1975/76	33	46
Paraguay	1979	61	85
Peru	1977/78	97	149
Trinidad & Tobago	1977	43	50
Venezuela	1977	53	64
<u>Middle East</u>			
Jordan	1976	66	80
Syrian Arab Republic	1978	65	87
Turkey	1978	133	166

a/ Deaths to infants under age one, per 1,000 live births.

b/ Deaths per 1,000 children aged 0-4, i.e., including infant mortality.

Table 7. Mortality under age five and infant mortality rates for five-year periods prior to each survey, for children whose mother was aged 20-29 years at time of births

Region and country	Survey year	Mortality under age five				Infant mortality			
		0-4	5-9	10-14	15-19	0-4	5-9	10-14	15-19
<u>Africa</u>									
Kenya	1977/78	135	148	156	193	83	88	96	121
Lesotho	1977	166	177	188	169	122	123	139	115
Senegal	1978	251	270	294	268	102	116	115	106
Sudan (North)	1978/79	129	123	140	142	67	72	71	49
<u>Asia and Pacific</u>									
Bangladesh	1976	209	187	205	230	117	110	130	140
Fiji	1974	52	56	61	70	42	48	50	59
Indonesia	1976	152	163	199	218	88	89	112	117
Malaysia	1974	47	52	71	105	36	38	51	72
Nepal	1976	233	241	294	293	142	149	182	172
Pakistan	1975	203	188	219	252	132	128	130	156
Philippines	1978	85	86	86	91	52	54	50	55
Republic of Korea	1974	51	81	101	114	35	51	53	64
Sri Lanka	1975	81	81	88	102	58	57	59	61
Thailand	1975	83	108	122	138	57	76	86	95
<u>Latin America and Caribbean</u>									
Colombia	1976	90	101	117	134	57	64	72	84
Costa Rica	1976	51	76	100	90	44	59	81	60
Dominican Republic	1975	121	136	162	118	81	98	105	72
Guyana	1975	72	63	72	89	54	50	56	67
Haiti	1977	187	234	255	244	124	149	157	143
Jamaica	1975/76	48	43	54	100	39	30	40	79
Mexico	1976/77	84	109	119	139	60	75	80	86
Panama	1975/76	36	56	62	83	26	43	39	60
Paraguay	1979	73	63	78	64	52	45	57	43
Peru	1977/78	141	158	193	211	89	102	112	122
Trinidad & Tobago	1977	41	50	46	60	33	41	39	54
Venezuela	1977	55	63	58	78	45	45	41	44
<u>Middle East</u>									
Jordan	1976	76	85	121	186	66	62	76	111
Syrian Arab Republic	1978	84	89	121	138	62	66	80	86
Turkey	1978	151	176	206	267	119	128	146	176

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E. Infant and child mortality as a determinant of
fertility: The policy implication

Susan Cochrane and K. Zachariah

INTRODUCTION*

This paper is devoted to exploring some aspects of the effect of infant and child mortality on fertility. It does not exhaust all aspects of that relationship and, of course, the effect of mortality on fertility is only part of the total relationship between the two variables. To design analysis and projects one must be aware of the converse direction of causation.

The 1975 Bangkok Conference represents the existing state of the evidence on the effect of infant and child mortality on fertility. The conclusion of that Conference has been summarized as "on average, an additional child death in the family, ceteris paribus, leads to far less than one additional birth" (Preston, 1978, 11).

While this effect was observed to vary depending on the level of socio-economic development, it is less than one half in all the countries studied (Preston, 1975, 191). This agrees with one elasticity of .33 that McGreevey and Birdsall found in their review of the evidence (McGreevey and Birdsall, 1974, 65).

There is substantial new evidence available from the World Fertility Survey (WFS) that will be reviewed in this paper. That evidence shows varying impacts of mortality on fertility depending on the methodology used. This paper both reviews a set of new WFS tabulations covering 25 countries which estimate the effect of a woman's mortality experience on her fertility behaviour, and puts that evidence into a context which will help address the policy issues.

This approach focuses on the narrowly defined effects of an individual couple's infant and child mortality experience on their fertility, but it ignores the long-term communal aggregate effects, such as changes in perceived mortality which change insurance motivations for childbearing and changes in the age at marriage. These latter issues are extremely relevant to the long-run demographic balance, but they cannot be examined in a paper of this length. (See Coale, 1973, for a discussion of the two demographic transitions -- the first in age at marriage and the second in marital fertility.)

*World Bank.

Unanswered policy questions

There are many different ways of interpreting the question: "Does mortality decline affect fertility"? At one extreme there are those who claim that a mortality decline will bring about an equal decline in fertility. If this interpretation were correct, one could achieve mortality reductions, which are desirable in and of themselves, without paying the price of prolonged acceleration in population growth. The work cited above indicates this is not the case. But other policy questions need to be answered: (a) Is mortality decline necessary to initiate fertility decline? (b) Is mortality decline a cost-effective way to initiate fertility decline? and (c) Do mortality reduction (health) and family planning programmes have a synergistic effect?

The policy implications of these questions differ substantially. If any one of them is answered in the affirmative, it implies that there may be arguments for investing in mortality-reducing programmes beyond what is desired on health grounds alone in order to stimulate fertility decline.

If mortality decline is necessary to initiate fertility decline, then health programmes must be introduced prior to or in tandem with family planning programmes. The issue of lags is critical to understanding the proper timing of the introduction of various programmes. Even if mortality decline is not necessary to bring about fertility decline, it may be a cost-effective way to do so. The cost-effectiveness of health programmes or mortality reduction in bringing about fertility reduction must not be considered only vis-à-vis family planning programmes, but also vis-à-vis other programmes, such as improvement in education, but to do so is beyond the scope of this paper.

The weakest statement of the relationship would be that health and family programmes will have a synergistic effect because mortality decline enhances the motivation for family planning. Whether such synergistic effects can be capitalized on depends on the increased problems, increased costs and perhaps reduced efficiency that arise from combining programmes.

It became obvious early from the literature that, in general, mortality decline has not always been necessary for fertility decline. In both France and the United States of America, fertility decline began before or simultaneously with mortality decline. This probably resulted from massive economic and social changes which shifted the demand for children downward.

In many currently developing countries there may be massive changes which would lead parents to want fewer children than they could have with unrestricted fertility and existing mortality rates. This would lead to a demand to restrict fertility through contraceptives or to changes in age at marriage. Therefore, instead of discussing necessity (which is difficult to prove in any case), it is more productive to discuss alternative strategies for reducing either population growth or fertility.

Here an important decision point arises both for policy and for research. Should the objective of policy be simply to minimize population growth. In the analysis here it was assumed that mortality reduction is an end in and of itself. Therefore, to achieve demographic balance one must determine what strategies would maximize fertility reduction. In this paper two strategies are examined: (a) reduce infant mortality and (b) increase access to family planning. It is expected that the optimal strategy would vary depending on the environment, and the analysis here verifies this point.

The comparison of these two strategies required that estimates be made of (a) the cost of preventing an additional birth through expanding the family planning programme in a country, (b) the cost of preventing an infant death through an expansion of a health programme and (c) the effect of infant mortality on fertility. There are substantial difficulties in estimating the costs of preventing a birth or an infant or child death, which will be discussed later. The primary function of this paper is to estimate the effect of infant and child mortality and fertility using WFS data from 25 countries.

THE CHANNELS: THEORY AND MEASUREMENT

The channels through which infant and child mortality may affect fertility are biological and behavioural. The behavioural effects may operate at the community as well as at the individual level. The ease of measuring the effects varies according to the channel being considered, with the communal being the most nebulous. For this reason the biological, then the individual behavioural effects will be reviewed. As mentioned earlier, communal effects will be ignored in this paper.

The biological effects

The biological effect of infant mortality and to a lesser extent of child mortality on fertility occurs through the premature termination of breast-feeding and the consequent shorter post-partum amenorrhea. This effect has been very widely reviewed, modeled and estimated (Potter, 1963; Perrin and Sheps, 1964; Sheps and Perrin, 1964). The magnitude of the effect will depend on the normal length of breast-feeding and the relationship between breast-feeding and amenorrhea. There are substantial cross-country differences in the length of breast-feeding, and differences in the estimated relationship between breast-feeding and amenorrhea. The longest observed average amenorrhea is 18.9 months in Bangladesh (Bongaarts, 1978). Chen reports that 45 per cent of the length of the birth intervals could be accounted for by lactation amenorrhea (Chen, and others, 1974). There is evidence that the relationship between lactation and amenorrhea depends on the nutritional status of the mother (Bongaarts, 1979, 15) and the pattern of supplemental feeding of the child. In an environment similar to Bangladesh

infant and child mortality could substantially alter breast-feeding, shorten birth intervals and increase the number of children ever born if contraception were not used.

The biological effect can be measured by comparing the birth intervals in which the previous child died and in which the child survived, controlling for a number of variables to be discussed later. These birth intervals could be contaminated by behavioural effects as well, however, if contraception for spacing were used, and its adoption depends on the survival status of the child.

Table 1 summarizes WFS data on the effect of a child loss on median birth intervals. Table 2 shows the medians for those who have never used contraceptives. Table 3 summarizes regression coefficients for showing the effect of a child death on the birth interval, controlling for mother's age, mother's education, husband's occupation, and wife's work status and rural residence. The expected pattern is that the longer the child lives, the longer the birth interval. The difference in birth intervals reflects the increase in exposure to childbearing caused by infant mortality. The data do not perfectly fit this expectation. In a third of the cases for the first, third and fifth intervals, there is a deviation from the expected pattern. This is explained in part by the small number of cases in some categories. In addition, the data on birth intervals are not of uniformly good quality in all countries. Averages over the 22 countries with comparable data show that in the first interval, a neonatal death shortens the interval by 4.7 months and a post-neonatal death by 2.4. For third and fifth intervals, the figures are 4.5, 3.5 and 4.1, 3.6, respectively.

The majority of the effects measured above are probably biological, but the difference in birth intervals between those whose previous child died and those whose previous child survived also depends on whether child loss affects how long a couple uses family planning in that birth interval. To control for this factor, the median birth intervals by child survival are shown for those women who have never used contraceptives in table 2. Here, as in table 1, slightly over a third of the cases deviate from the expected pattern and the values do not differ systematically from those found for all women. In summary then, medians indicate that neonatal mortality increases birth intervals by between 3.2 and 6.0 months, on the average, and post-neonatal mortality increases these intervals by 1.7 to 3.8 months.

The regression results in table 3 show negative effects of an infant death on birth intervals in almost all cases and negative significant effects are observed in 49 per cent of the cases. The average values of all coefficients for a neonatal death for the first, third and fifth birth intervals are 7.7, 5.1 and 5.8, respectively. The effect of a post-neonatal death are 4.3, 5.5 and 5.8, when all coefficients are averaged.

For women who have never used contraceptives and for whom the effects are thus more biological than behavioural, the effect of neonatal mortality are 7.7, 5.5. and 5.9 and the effects of post-neonatal mortality are 4.0 6.0 and 6.2.

Table 4 summarizes the effect of infant death on birth intervals for three parities as estimated by median differences and regression equations for all women and those who have never used contraceptives. The regression equations give higher estimates of mortality effects than do median values.^{1/} No clear pattern emerges across parities, nor between all women and those never using contraceptives. More surprisingly, post-neonatal effects are not always smaller than those of neonatal.

It is difficult to put these data in the context of other research since the methodology is somewhat different, but in an earlier study of rural and semi-urban areas of the following countries, the effect of an infant death reduced the birth interval by 3.5, 4.3, 6.2 and 4.6 months, respectively, in Colombia, Costa Rica, Peru and Mexico (Rutstein and Medica, 1978). For these countries the present study's average regression coefficients for neonatal and post-neonatal effects were 6.2 and 4.6, 6.0 and 3.4, 6.3 and 4.4, and 6.7 and 4.9, respectively. Thus, the estimates are fairly close considering differences in time periods, methodologies and samples.

Infant and child mortality experience on contraceptive use

The above data on birth intervals for all women incorporate behavioural as well as biological effects to the extent that mortality experience affects contraceptive usage in the interval. Analysis of the effect of child death experience on contraceptive usage is shown in table 5. For women with between four and six children, without exception those women who have experienced a child death are less likely to have ever used contraceptives. For current use, in 23 of 25 cases those who have had a child death are less likely to be using contraception than those with no death.

Combining all parities and controlling for the number of children ever born, rural residence, wife's education, husband's occupation and wife's work status, the experience of child mortality reduces contraceptive use in all cases and in 20 of 25 cases this is statistically significant at the 5 per cent level. The largest effect is in Jamaica where a child death reduces usage by 9.4 per 100.

Other data from multiple classification analysis are useful for comparison here. In Colombia, women with one child death were 2.3 per cent less likely to use contraceptives than those with no death. Our regression gives 4.7. For Costa Rica, Peru, and Mexico our figures of 5.2, 4.7 and 2.5 compared with 3.5, 1.4 and 2.3 (see Rutstein and Medica, 1978). Again given different time periods, data sets and methodology, the findings seem robust.

The effect of infant and child mortality on parity

The biological and behavioural responses to child mortality experiences ultimately have their effect on completed family size. Table 6 summarizes the effect of child mortality experience on parity progression ratios. At parity 1, 2 and 3 those who have experienced child mortality have a higher probability of having additional children than those couples who have not experienced mortality. In the 189 comparisons on these three parities there are only three exceptions to this pattern. At the higher parities 5 and 6, the pattern also prevails, but with a few more exceptions (eight of 126 comparisons). In most cases the more recent the death, the higher the probability of having an additional child. That is, if the last child dies the progression ratio is higher than if the next to last child died. Among those with two or more children, if the second child dies, the probability of having an additional child is 16 per cent higher. At parity 6, it is 20 per cent higher. Rutstein and Medica calculated adjusted parity progression ratios based on mortality experience. Their data show much smaller effects than those observed here. Using 1962 data from France, Vallin and Lery found mortality had a 30 per cent effect on parity progression rates at second parity and 19 per cent at fifth. Thus, the results of the present study are more like those for modern France than those found by Rutstein and Medica, but this may result from the multivariate nature of their analyses.

It is easier to understand the impact of previous mortality on fertility if one looks not at parity progression ratios but at the additional number of births. Table 7 shows the difference in total additional children ever born to women with different mortality experiences. For example, the first entry for Bangladesh shows that women who have had two or more children have an average of .44 fewer children if the first two survived than if the first survives and the second dies. They have .40 fewer than women whose first died and second survived and 1.01 fewer than those whose first two died. The differences are generally large, and in most cases significant. Only in the Dominican Republic, Haiti, Paraguay and Sri Lanka is the pattern generally not significant.

These differences are not necessarily causally related to mortality, however, because both additional fertility and mortality experience may be related to common factors such as age, education, socio-economic status or residence. Therefore, regression equations were used to estimate the effect of mortality on additional births (see table 8). At parity 2+, in 17 of 25 cases, both the death of i th and i th-1 child's death has a significant effect. In an additional 5 the i th or i -1st child's death has a significant effect. Significance is somewhat less at higher parities due, in part, to smaller sample sizes. The average effect of an infant death on subsequent fertility in the regression is .48--larger than has been generally estimated in other studies where an effect of .20 to .33 is found, and in many cases the effect exceeds .5, which is larger than found in Preston, 1978.

The effect of infant mortality on additional fertility from the regression equations can be compared with the effect of neonatal and post-neonatal mortality on birth interval and therefore on births (table 8). Birth interval effects are estimated by dividing the effect of a death on a birth interval obtained from weighted averages of regression coefficients for parity 2 through 6 by the average birth interval for surviving children. This represents the lower bound of the effect for two reasons. First, the birth interval for surviving infants is greater than the average interval for all children. Second, the birth interval effect includes only the biological effect and effects of contraceptive use within the interval (spacing), not the ultimate effect of infant mortality on contraceptive use to terminate childbearing.

There is enormous variation from country to country in both estimates of mortality effect on fertility. In all cases but two (Jamaica and Sri Lanka) the estimates from added parity exceed those derived from birth intervals. A test of the relationship between the magnitude of mortality's effect on fertility showed little systematic association with country characteristics, such as GNP per capita, total fertility rates, and infant mortality rates. The only significant pattern found was that the effect of post-neonatal mortality on fertility was larger the lower the level of income, but the elasticity was small. Preston's curvilinear patterns did not emerge (Preston, 1975).

COST-EFFECTIVENESS OF VARIOUS PROGRAMMES FOR FERTILITY REDUCTION

In considering the cost of reducing fertility through improvements in mortality, it must be stressed that any fertility-reducing effect of programmes to improve health and mortality are incidental to the main benefits of such programmes. Nonetheless, it is of interest to inquire whether mortality-reduction programmes might also be a cost-effective way of decreasing fertility. In the discussion below, the cost of averting a birth through family planning programmes is compared to the cost of averting a birth through the short-run effects of a reduction in infant mortality.

There are some similar general issues involved in estimating the fertility impact and cost of family-planning and mortality-reducing programmes. The general principle involved will first be reviewed, followed by a separate discussion of the two estimation techniques.

The marginal cost of preventing a birth or preventing an infant or child death is needed. To obtain such figures it would be necessary to separate capital from variable costs and have an estimate of how variable costs change with level of programme activity. Generally, however, only total cost and total clients or patients served are available. Thus, only average cost per individual served can be calculated from existing statistics. This may be an inaccurate measure of marginal costs for several reasons. To the extent that capital costs are included, these costs will not necessarily increase if

numbers served increase, and, to this degree, average costs may overestimate cost per clients or patient. If capital and variable costs could be separated, a problem may still arise if variable costs are rising or falling. If clients and patients in more remote areas or who are more difficult to treat or recruit are the marginal group, marginal cost may well be rising and average cost would tend to underestimate cost. A final problem that exists is that of joint costs. If several services are offered jointly, it is extremely difficult to allocate joint costs to the appropriate activity.

All these factors would have to be carefully weighed in making calculations to be used for actual policy-making. The cost figures used below are not made with detailed care, but were drawn from a wide variety of sources to maximize the kinds of mortality and fertility environment considered. The cost per birth-prevented figures are average costs for existing programmes with all the problems of variable, capital and joint costs. Thus, there may be a tendency for the birth-averted cost to be somewhat too high on the average relative to those for deaths averted.

Cost-effectiveness of family planning programme

To determine the cost of a birth prevented through a family planning programme one needs to determine the cost of the family planning programme, the number of users of various methods from the programme, the average length of time for which methods are used and the fertility that users would have had if no method were adopted. (In detailed analysis the cost would be estimated separately by method.)

The United States Agency for International Development (USAID) has assembled estimates of the resources devoted to family planning programmes and the number of married women in the population in 1980. Various estimates exist of user rates for this period and these data can be combined to get number of users and thus cost per user (table 9).

The costs per user varies substantially with a low of \$ 4.88 in Colombia to a high of \$ 71.61 in Kenya. Those countries with very low cost per user correspond well to the countries that are known to be successes in family planning (Colombia, Indonesia, Republic of Korea, Sri Lanka, and Thailand).

In some cases very high costs per user reflect the fact that health expenditures are difficult to separate from family planning, but for the outliers, Kenya and Nepal, even if we delete completely all host country contributions for which this problem arises, we still find very high cost per user \$ 49 for Kenya and \$ 35 for Nepal.

To translate cost per user into cost per birth averted, we need to make assumptions about continuation rates and the fertility foregone by those using contraception. Here we have arbitrarily assumed each user has one year of coverage. (If one assumed average use of one half year, then clearly costs per

birth averted would be doubled). Data from WFS on age-specific fertility rates and age-specific user rates allow an estimate of births averted. Two estimations were made. First, it was assumed that users of efficient methods had zero fertility and would have had the age-specific fertility of the average women if she had not used contraception. Using existing age-specific marital fertility, the average births averted per user was calculated. For countries with low user rates the approximation is probably acceptable, but for countries with high user rates this underestimates the births averted. Therefore, a second technique was used whereby the existing age-specific marital fertility rate was increased by reducing the women at risk by a proportion equal to the proportion using efficient methods. The high and low estimates of births averted are shown in table 9 along with the corresponding cost figures.

The costs per birth averted differ considerably between the two techniques for high-usage countries, Costa Rica and Panama being the clearest examples. For low-usage countries the values are very close. By either technique Kenya and Nepal are again outliers with costs considerably in excess of any other country.

Cost per birth averted through mortality reduction

Data on cost per birth averted through family planning programmes are relatively straightforward because of the wealth of data on age-specific fertility and user rates as well as on programme costs. For calculating the cost of a birth averted through a mortality reduction programme, only limited data exist on both the cost of preventing a death and the effect of a death averted on fertility. In this section, the data available on the cost for averting a death are reviewed and combined with data from the earlier section on births averted by preventing an infant death.

A number of papers have recently been prepared on the cost of preventing a death for a number of developing countries. These estimates are summarized in table 10. The costs vary widely depending on the type of health intervention (preventive, curative) and the estimation technique (see the range in the case of malaria). The lowest cost estimates come from the Narangwal programme, from vaccination and immunization programmes in Morocco, and from Kenya where for various programmes the costs per death averted is less than \$ 100. Overall the figures seem consistent with the Walsh and Warren estimates of the cost per infant and child death averted from selective primary care intervention of between \$ 200 and \$ 250. The cost per death averted depends on the level and pattern of infant and child deaths in a country as well as the costs of delivering health care.

The highest costs are associated with the upper range of estimates for malaria eradication in Bangladesh by Prescott, and the Walsh and Warren estimates of the impact of community water supply and sanitation.

Given the limited data on costs per death averted, calculations are made in all cases using Warren and Walsh estimates of \$ 250 per death averted. This is a conservative estimate. Where more specific data are available, several estimates are made for a country. For all estimates the largest and smallest estimates are used for the births averted by an averted death in table 11.

A comparison of tables 9 and 11 shows that in no case is the highest cost per birth averted from family planning above the lowest cost per birth averted through mortality reduction, using \$ 250 as the cost of an averted death. By the use of country-specific cost it becomes evident that in Kenya measles vaccine as a free-standing programme or an add-on programme is considerably less than family planning. If one uses the lowest estimate of the effect of mortality on fertility, then only a measles add-on programme in Kenya is superior to family planning for reducing fertility.

The results in table 11 are very tentative, not only because of the wide range of effects of mortality on fertility but because of the cost of preventing deaths. If the Narangwal programme could be replicated with costs as low as \$ 25 per death averted, then a wide range of countries could be added - Bangladesh, Costa Rica, Jordan, Malaysia, Nepal, Pakistan, Panama, Philippines, Republic of Korea, and, marginally, Indonesia - to Kenya as countries where mortality reduction could be a cost-effective way to reduce fertility. Clearly, however, cost per death averted depends on disease patterns. Only the poorest, high-mortality countries like Bangladesh and Nepal and countries of Western Africa have real potential for very cheap mortality reduction.^{2/}

Caveats

The cost-effectiveness analysis above was designed to illustrate a fairly simple way of looking at the relationship between mortality and fertility from a policy perspective. But the world is not so simple and reservations about the above analysis suggest where further research is needed.

The analysis makes no explicit adjustment for a limited demand for contraception. In some countries like Kenya, very few people wish to limit fertility (more may wish to space). This means that there are few acceptors of the family planning which raises the cost per user and makes mortality reduction appear more cost-effective. In other countries, however, the low demand for family planning may result in little programme effort, and cost per acceptor might well appear to be low even if it would require substantial expenditure to increase usage. This might easily distort cost-effectiveness analysis.

If cost-effectiveness analysis is used, the question must be asked, are financial resources the limiting factor? If they are not, then the problem needs to be looked at differently. It may well be that reducing infant

mortality is necessary to increase the demand for contraceptives, but it may also be that this is not necessarily picked up by cost-effectiveness analysis. To address this issue, a more thorough analysis of contraceptive use and non-use, and of the role played by mortality in this process would be needed. This is a necessary further step in policy analysis of the effect of mortality on fertility.

In addition, to determine the synergistic effect of mortality and fertility-reducing programmes the economies or diseconomies that may arise in the supply of services as well as in the demand for services would have to be examined. This would require a separate literature review of delivery systems.

Finally, the discussion above has been narrowly focused on the cost effectiveness of family planning versus health programmes in reducing fertility. A more complete analysis would require a comparison of these with other programmes such as education which affect fertility. Furthermore, both health and family planning programmes have benefits beyond the reduction of fertility. In fact, improvement of maternal and child health is usually one of the goals of family planning programmes.

SUMMARY AND CONCLUSIONS

The estimates of the effect of infant mortality on fertility reviewed in this paper show substantial variation across countries and by the technique used. The effect is lower for methods that depend on the effect of mortality on birth intervals than for estimates of added births following an infant death. This is to be expected since birth intervals do not take into consideration the effect of child loss on the decision to limit rather than to space children with contraceptives. The estimates also differ by the technique used. Estimation with regression gives higher estimated effects than those derived from differences in mean or median birth intervals between those with surviving children and infant deaths. The regression results seem more probably correct in that they control indirectly for maternal health which would be correlated both with survival and fecundity.

Overall, the estimates for births averted through the effects of mortality on the birth interval are close to what is generally observed in the literature. The effects of a child death on subsequent fertility are substantially higher than generally observed - about half a child on the average. This may be due to the fact that regressions give a better estimate of the true effect or it may attest to the better quality of WFS data than those of earlier surveys.^{3/}

Even with the high estimates of the effect of an infant death on fertility, there is only one clear case where reducing infant deaths appears to be a more cost-effective way of reducing fertility than a family planning programme. This case is Kenya. It may well be that if more survey data were available on the high-mortality countries of Western Africa, a number of other

cases might emerge as well. But country-specific policy-making would require more detailed cost analysis in each case and the cost analysis here is only illustrative.

Cost-effectiveness analysis, however, implies simple tradeoffs and either-or strategies. In reality mortality and fertility interact in far more complex ways requiring more sophisticated analysis both of the adoption of contraception and the delivery of health and family planning services.

Notes

1/ This may arise because the use of medians allows no control, even indirectly, for maternal health. Healthier women will have shorter intervals and lower child mortality, ceteris paribus. So the intervals for children surviving are biased downwards, as is the difference in intervals. To the extent that education, rural residence and husband's occupation control for health, the regression equations do not have that shortcoming.

2/ Evans, Hall and Warford (1981) estimate \$ 2 per capita for coverage of a primary health care programme, but to translate this into cost per death averted, one needs death rates. With a crude birth rate of 50 and an infant mortality rate of 200, there would be 10 infant deaths per 1,000 population per year. Even if the primary health programme eliminated all infant deaths but no other deaths, the cost per death averted would be \$ 200.

3/ Birth histories in WFS make a more complete count of births and deaths probable.

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Table 1. Median birth intervals in months by survival of previous child

Country	All women											
	Interval 1				Interval 3				Interval 5			
	Died		Survived		Died		Survived		Died		Survived	
	0 - 1 months	2 - 11 months	0 - 1 months	12+ months	0 - 1 months	2 - 11 months	0 - 1 months	12+ months	0 - 1 months	2 - 11 months	0 - 1 months	12+ months
Bangladesh (WFS)	21.6	23.8	24.3		24.4	22.9	24.1		(16.1)	25.5		22.8
Colombia	16.1	19.3	20.8		16.0	17.3	22.4		14.5	16.3		22.5
Costa Rica	14.5	15.0	21.2		17.0	18.4	22.1		14.2	21.3		22.6
Dominican Republic			22.7				23.2					
Fiji	18.1	21.5	22.5			17.3	24.1			18.7		23.2
Guyana	[12.7]	16.7	19.2		22.8	22.0	24.1		23.3	17.3		22.0
Haiti	(24.9)	24.3	24.9		[15.5]	17.3	18.2		[15.0]	(18.8)		21.3
Indonesia	20.0	22.3	31.1		(22.5)	20.4	25.0		[23.3]	(24.3)		24.8
Jamaica	[18.0]	22.8	24.8		24.0	21.7	30.1		19.5	19.2		29.8
Jordan	(15.4)	18.5	19.5		[20.0]	(25.0)	24.7		[26.0]	[17.3]		22.0
Kenya	20.3	20.8	23.2		(15.8)	19.3	23.3		(19.5)	18.7		23.5
Lesotho	23.8	22.4	25.6		26.6	21.3	23.6		(25.6)	19.6		22.2
Malaysia	17.0	18.8	22.7		(20.5)	23.6	23.9		(19.5)	21.8		24.6
Mexico	16.5	17.3	22.0		17.5	18.6	24.0		(17.5)	21.4		25.1
Nepal	23.3	24.1	25.7		15.8	18.5	24.1		17.3	17.8		24.8
Pakistan	20.6	22.2	28.8		28.7	24.3	25.8		(31.7)	24.1		25.9
Panama	16.5	23.0	22.5		19.5	22.9	28.6		19.0	21.8		28.7
Paraguay			25.0		19.2	22.0	24.5		(23.7)	(18.5)		24.1
Peru	19.6	20.0	23.9				25.2			18.0		25.6
Philippines	14.0	19.6	20.2		19.9	18.8	25.4		18.7	21.1		25.9
Republic of Korea	17.0	23.1	24.4		14.3	20.3	23.1		14.1	21.0		24.2
Sri Lanka	19.5	21.2	25.2		(17.2)	24.5	26.4		[14.5]	26.5		25.2
Syrian Arab Republic	14.8	16.7	18.3		21.1	19.3	27.7		23.7	20.9		28.4
Trinidad & Tobago	(20.0)	22.0	17.9		17.0	18.8	21.8		(16.5)	18.8		22.0
Venezuela			21.1		[15.1]	(16.7)	18.3		N/A	(17.7)		18.8
							23.3			(21.0)		22.7

Note: () = less than 25 cases.
 [] = less than 10 cases.
 N/A = no cases.

Table 2. Median birth intervals in months by survival status of previous child

Country	Never used contraceptive									
	Interval 1				Interval 3				Interval 5	
	Died 0 - 1 months	Died 2 - 11 months	Survived 12+ months	Died 0 - 1 months	Died 2 - 11 months	Survived 12+ months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Survived 12+ months
Bangladesh (WFS)	22.5	24.2	24.5	24.5	23.4	23.9	(17.1)	24.9	(17.1)	22.8
Colombia	15.5	21.0	22.6	15.0	15.5	23.3	(13.3)	(15.8)	(13.3)	23.9
Costa Rica	(14.1)	(16.0)	21.2	[20.0]	(17.0)	22.9	[12.0]	(17.5)	[12.0]	24.3
Dominican Republic	-----19.5-----	-----	23.7	-----19.0-----	-----	24.3	-----18.0-----	-----	-----	24.1
Fiji	23.8	(28.0)	21.0	(25.0)	(26.0)	(30.5)	[25.5]	[17.3]	[25.5]	(27.0)
Guyana	[12.3]	(17.0)	19.7	[17.5]	(19.0)	17.8	[14.0]	[20.5]	[14.0]	21.7
Haiti	(25.3)	24.6	25.1	(17.5)	19.9	24.4	[23.3]	[23.0]	[23.3]	25.3
Indonesia	20.6	22.6	31.6	24.1	21.2	30.3	19.9	20.5	19.9	30.4
Jamaica	[20.0]	(28.0)	27.0	N/A	[26.0]	26.0	[26.0]	[22.0]	[26.0]	(18.0)
Jordan	[16.0]	21.7	21.4	[15.9]	19.5	23.5	[16.4]	21.4	[16.4]	24.3
Kenya	20.9	21.2	23.6	(25.8)	21.1	23.2	(22.4)	20.5	(22.4)	22.2
Lesotho	(24.1)	22.8	25.2	(23.4)	23.7	23.5	[19.4]	(21.8)	[19.4]	24.0
Malaysia	16.3	22.3	25.6	17.5	19.8	24.3	(13.5)	22.8	(13.5)	25.5
Mexico	16.9	16.9	23.7	17.5	18.4	24.8	16.8	17.8	16.8	25.5
Nepal	23.4	24.0	25.9	28.7	24.2	25.6	(26.4)	24.3	(26.4)	25.8
Pakistan	20.5	22.3	29.2	19.8	23.4	29.1	19.5	21.2	19.5	29.1
Panama	18.5	(24.0)	24.2	[19.0]	(22.2)	25.4	(23.8)	[16.8]	(23.8)	25.4
Paraguay	-----22.0-----	-----	25.2	-----19.5-----	-----	25.3	-----17.0-----	-----	-----	25.2
Peru	21.0	20.0	24.8	19.4	19.7	25.8	19.1	21.4	19.1	26.3
Philippines	13.7	20.3	20.8	(14.1)	20.9	24.6	(13.2)	25.1	(13.2)	24.5
Republic of Korea	(20.8)	27.5	27.5	[17.5]	24.9	27.6	[12.3]	(24.0)	[12.3]	28.1
Sri Lanka	20.4	21.8	26.7	21.2	23.0	28.6	23.4	19.3	23.4	28.7
Syrian Arab Republic	14.8	16.9	19.3	(15.0)	17.0	22.3	(16.0)	20.5	(16.0)	22.5
Trinidad & Tobago	[56.1]	[26.8]	16.7	N/A	[15.7]	(20.6)	N/A	[23.2]	N/A	[18.3]
Venezuela	----- (24.0) -----	-----	23.5	----- (20.0) -----	-----	24.1	----- [25.0] -----	-----	-----	23.9

Note: () = less than 25 cases.

[] = less than 10 cases.

N/A = no cases.

Table 3. The effect of neonatal and post-neonatal mortality on birth intervals 1, 3, and 5 from regression equations ^{a/}

Country	All women												Never used contraceptive											
	Interval 1				Interval 3				Interval 5				Interval 1				Interval 3				Interval 5			
	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months	Died 0 - 1 months	Died 2 - 11 months
Bangladesh (WFS)	- 9.3*	- 4.1*	- 3.6	- 4.3*	- 6.7	- 2.7	- 8.8*	- 4.1*	- 2.8	- 4.4*	- 5.1	- 4.4*	- 8.8*	- 4.1*	- 2.8	- 4.4*	- 8.8*	- 4.1*	- 2.8	- 4.4*	- 8.8*	- 4.1*	- 2.8	- 4.4*
Colombia	- 5.6*	+ 1.3	- 3.0	- 6.1*	- 9.3*	- 5.4*	- 7.6*	+ 5.6	- 1.6	- 8.5*	- 10.2*	- 7.6*	+ 5.6	- 1.6	- 8.5*	- 10.2*	- 7.6*	+ 5.6	- 1.6	- 8.5*	- 10.2*	- 7.6*	+ 5.6	- 1.6
Costa Rica	- 6.5*	- 5.9	- 3.5	- 5.5*	- 8.7*	- 2.4	- 11.1*	- 4.0	- 8.7	- 6.5	- 14.8*	- 11.1*	- 4.0	- 8.7	- 6.5	- 14.8*	- 11.1*	- 4.0	- 8.7	- 6.5	- 14.8*	- 11.1*	- 4.0	- 8.7
Dominican Republic	- 7.1*	- 6.8*	- 3.4	- 5.1	- 1.2	- 4.7	- 2.9	- 1.3	- 0.3	- 4.6	- 13.7*	- 6.8*	- 1.3	- 0.3	- 4.6	- 13.7*	- 6.8*	- 1.3	- 0.3	- 4.6	- 13.7*	- 6.8*	- 1.3	- 0.3
Fiji	- 4.5*	- 1.7	- 3.4	- 5.1	- 1.2	- 4.7	- 2.9	- 1.3	- 0.3	- 4.6	- 13.7*	- 6.8*	- 1.3	- 0.3	- 4.6	- 13.7*	- 6.8*	- 1.3	- 0.3	- 4.6	- 13.7*	- 6.8*	- 1.3	- 0.3
Guyana	- 9.3	- 6.2*	- 4.2	- 0.8	- 8.7	- 6.2	- 15.4	- 4.7	- 4.2	- 1.6	- 10.6	- 15.4	- 4.7	- 4.2	- 1.6	- 10.6	- 15.4	- 4.7	- 4.2	- 1.6	- 10.6	- 15.4	- 4.7	- 4.2
Haiti	- 5.1	- 3.7	- 7.8	- 5.6*	- 9.4	- 5.7	- 5.8	- 5.6	- 10.6*	- 6.3	- 7.8	- 5.8	- 5.6	- 10.6*	- 6.3	- 7.8	- 5.8	- 5.6	- 10.6*	- 6.3	- 7.8	- 5.8	- 5.6	- 10.6*
Indonesia	- 12.6*	- 10.1*	- 7.0*	- 8.2*	- 8.4*	- 11.6*	- 13.2*	- 10.3*	- 6.4*	- 8.4*	- 8.3*	- 13.2*	- 10.3*	- 6.4*	- 8.4*	- 8.3*	- 13.2*	- 10.3*	- 6.4*	- 8.4*	- 8.3*	- 13.2*	- 10.3*	- 6.4*
Jamaica	- 13.5	- 4.7	+ 10.0	- 3.3	- 3.3	- 3.5	- 19.1	- 2.2	-	- 12.9	- 9.0	- 19.1	- 2.2	-	- 12.9	- 9.0	- 19.1	- 2.2	-	- 12.9	- 9.0	- 19.1	- 2.2	-
Jordan	- 5.9	- 1.3	- 5.3	- 2.8*	- 0.5	- 5.8*	- 6.5	- 0.2	- 4.1	- 2.3	+ 1.8	- 6.5	- 0.2	- 4.1	- 2.3	+ 1.8	- 6.5	- 0.2	- 4.1	- 2.3	+ 1.8	- 6.5	- 0.2	- 4.1
Kenya	- 7.5*	- 6.5*	- 2.4	- 4.7*	- 3.0	- 7.1*	- 7.7*	- 5.9*	- 2.6	- 4.8*	- 1.2	- 7.7*	- 5.9*	- 2.6	- 4.8*	- 1.2	- 7.7*	- 5.9*	- 2.6	- 4.8*	- 1.2	- 7.7*	- 5.9*	- 2.6
Lesotho	- 11.9*	- 9.4*	- 7.9	- 8.3*	- 7.7	- 8.2*	- 12.2*	- 9.0*	- 3.0	- 7.8*	- 7.8	- 12.2*	- 9.0*	- 3.0	- 7.8*	- 7.8	- 12.2*	- 9.0*	- 3.0	- 7.8*	- 7.8	- 12.2*	- 9.0*	- 3.0
Malaysia	3.0	- 3.9*	- 8.0*	- 5.4*	- 10.7*	- 1.6	- 6.6	- 5.7*	- 12.3*	- 7.0*	- 14.6*	- 6.6	- 5.7*	- 12.3*	- 7.0*	- 14.6*	- 6.6	- 5.7*	- 12.3*	- 7.0*	- 14.6*	- 6.6	- 5.7*	- 12.3*
Mexico	- 5.4*	- 4.5*	- 8.0*	- 3.0	- 6.8*	- 7.2*	- 8.8*	- 7.4*	- 7.5*	- 3.1	- 7.7*	- 8.8*	- 7.4*	- 7.5*	- 3.1	- 7.7*	- 8.8*	- 7.4*	- 7.5*	- 3.1	- 7.7*	- 8.8*	- 7.4*	- 7.5*
Nepal	- 10.1*	- 7.1*	- 2.5	- 6.1*	+ 2.7	- 5.9*	- 10.5*	- 7.4*	- 2.6	- 6.1	+ 1.9	- 10.5*	- 7.4*	- 2.6	- 6.1	+ 1.9	- 10.5*	- 7.4*	- 2.6	- 6.1	+ 1.9	- 10.5*	- 7.4*	- 2.6
Pakistan	- 7.6*	- 4.9*	- 6.8*	- 6.8*	- 7.1*	- 6.2*	- 8.0*	- 5.2*	- 6.6*	- 6.3*	- 6.6*	- 8.0*	- 5.2*	- 6.6*	- 6.3*	- 6.6*	- 8.0*	- 5.2*	- 6.6*	- 6.3*	- 6.6*	- 8.0*	- 5.2*	- 6.6*
Panama	- 4.2*	+ 1.9	- 5.5	- 1.6	+ 0.3	- 9.4*	- 0.3	+ 1.1	- 4.1	- 5.2	+ 2.0	- 0.3	+ 1.1	- 4.1	- 5.2	+ 2.0	- 0.3	+ 1.1	- 4.1	- 5.2	+ 2.0	- 0.3	+ 1.1	- 4.1
Paraguay	- 5.5*	- 7.5*	- 4.0*	- 7.1*	- 7.2*	- 6.9*	- 3.7	- 7.6*	- 4.5*	- 6.3*	- 7.6*	- 3.7	- 7.6*	- 4.5*	- 6.3*	- 7.6*	- 3.7	- 7.6*	- 4.5*	- 6.3*	- 7.6*	- 3.7	- 7.6*	- 4.5*
Peru	- 7.6*	- 6.6*	- 4.0*	- 7.1*	- 7.2*	- 6.1*	- 7.1*	- 7.6*	- 4.5*	- 6.3*	- 7.6*	- 7.1*	- 7.6*	- 4.5*	- 6.3*	- 7.6*	- 7.1*	- 7.6*	- 4.5*	- 6.3*	- 7.6*	- 7.1*	- 7.6*	- 4.5*
Philippines	- 9.2*	- 3.6*	- 10.0*	- 4.2*	- 7.8*	- 6.3*	- 11.5*	- 4.1*	- 12.4*	- 4.5*	- 11.2*	- 11.5*	- 4.1*	- 12.4*	- 4.5*	- 11.2*	- 11.5*	- 4.1*	- 12.4*	- 4.5*	- 11.2*	- 11.5*	- 4.1*	- 12.4*
Republic of Korea	- 11.9*	- 5.2*	- 11.1*	- 9.3*	- 15.3*	- 6.4*	- 11.2*	- 5.0*	- 16.2*	- 10.3*	- 14.3	- 11.2*	- 5.0*	- 16.2*	- 10.3*	- 14.3	- 11.2*	- 5.0*	- 16.2*	- 10.3*	- 14.3	- 11.2*	- 5.0*	- 16.2*
Sri Lanka	- 8.5*	- 7.1*	- 4.3*	- 8.3*	- 3.0	- 10.8*	- 9.5*	- 8.5*	- 2.4	- 8.7*	- 1.3	- 9.5*	- 8.5*	- 2.4	- 8.7*	- 1.3	- 9.5*	- 8.5*	- 2.4	- 8.7*	- 1.3	- 9.5*	- 8.5*	- 2.4
Syrian Arab Republic	- 6.6*	- 3.7*	- 5.3*	- 5.6*	- 6.3	- 6.8*	- 7.3*	- 4.5*	- 6.5*	- 5.4*	- 6.2	- 7.3*	- 4.5*	- 6.5*	- 5.4*	- 6.2	- 7.3*	- 4.5*	- 6.5*	- 5.4*	- 6.2	- 7.3*	- 4.5*	- 6.5*
Trinidad & Tobago	- 4.2	+ 2.0	- 9.3	- 8.7*	-	+ 3.5	+ 21.6	+ 8.7	+ 13.9	- 5.8	-	+ 21.6	+ 8.7	+ 13.9	- 5.8	-	+ 21.6	+ 8.7	+ 13.9	- 5.8	-	+ 21.6	+ 8.7	+ 13.9
Venezuela	- 2.2	-	- 5.8	-	- 0.1	-	- 3.4	-	- 7.6	-	-	- 3.4	-	- 7.6	-	-	- 3.4	-	- 7.6	-	-	- 3.4	-	- 7.6

* Significant.

^{a/} Controlling for mother's age, mother's education, husband's occupation, and for wife's work, status and rural residence.

Table 4. The effect of infant deaths on birth intervals estimated by medians and by reduction interval if an infant death occurs

Regression equations			
	parity 1	parity 3	parity 5

<u>All women</u>			
Median differences			
Neonatal	4.6	4.4	4.2
Post-neonatal	2.2	3.4	3.4
Regression results			
Neonatal	7.8	5.0	5.8
Post-neonatal	4.3	5.6	5.7
<u>Non-contraceptors</u>			
Median differences			
Neonatal	3.1	4.9	5.8
Post-neonatal	1.5	3.8	3.5
Regression results			
Neonatal	7.7	5.4	6.2
Post-neonatal	3.8	6.1	6.2

Table 5. The effect of child death experience on contraceptive usage

Country	Proportions ever using and currently using contraception by child death experience (Parities 4 - 6)				Effect of number of child deaths on current contraceptive usage <u>a/</u>
	Women ever using contraception		Women currently using contraception		
	(with child death)	(without child death)	(with child death)	(without child death)	
Bangladesh (WFS)	14.8	21.2	10.8	15.4	-.024*
Colombia	56.5	67.9	50.5	61.8	-.047*
Costa Rica	81.8	87.1	77.0	82.8	-.052*
Dominican Republic	53.9	59.0	48.7	53.2	-.031*
Fiji	74.2	80.3	55.2	65.1	-.060*
Guyana	54.1	63.3	37.7	44.1	-.049*
Haiti	35.5	46.2	24.4	31.7	-.026*
Indonesia	40.6	48.8	43.3	50.4	-.075*
Jamaica	61.1	75.8	20.0	45.5	-.094*
Jordan	40.0	55.3	27.7	45.5	-.043*
Kenya	27.5	41.2	5.6	14.5	-.021*
Lesotho	28.3	31.3	13.6	11.5	-.017*
Malaysia	39.5	55.8	38.3	48.2	-.059*
Mexico	37.6	56.1	34.8	49.8	-.025
Nepal	5.5	10.2	0.8	2.0	-.018*
Pakistan	9.2	17.4	6.7	12.5	-.015*
Panama	73.3	81.3	71.4	72.0	-.027
Paraguay	51.4	60.9	50.4	47.2	-.002
Peru	37.4	65.9	30.1	51.6	-.047*
Philippines	56.8	69.8	44.4	56.4	-.052*
Republic of Korea	60.3	72.7	50.1	56.8	-.061*
Sri Lanka	45.5	57.6	44.7	55.1	-.049*
Syrian Arab Republic	31.9	44.8	27.8	41.7	-.042*
Trinidad & Tobago	79.1	86.5	58.6	68.3	-.020
Venezuela	63.7	75.0	56.4	65.9	-.010

* Significant at 5 per cent

a/ Controlling for children ever born, rural residence, wife's education, husband's occupation and wife's work status.

Table 6. Parity progression ratios by survival status of the two previous children (parities 2-5)

Country	Parity 2				Parity 3			
	Both survived	1st died 2nd survived	1st survived 2nd died	Both died	Both survived	2nd died 3rd survived	2nd survived 3rd died	Both died
Bangladesh (WFS)	.80	.85	.90	.92	.78	.84	.91	.94
Colombia	.76	.85	.89	.94	.75	.78	.88	.96
Costa Rica	.73	.90	.88	.94	.73	.82	.89	.96
Dominican Republic	.79	.87	.89	.90	.78	.84	.90	.83
Fiji	.79	.90	.90	.96	.76	.84	.89	.84
Guyana	.80	.88	.91	.86	.79	.90	.85	.89
Haiti	.75	.80	.85	.84	.74	.73	.88	.83
Indonesia	.75	.82	.86	.92	.74	.77	.90	.92
Jamaica	.75	.91	.83	.78	.76	.90	.89	.61
Jordan	.86	.94	.97	.96	.85	.94	.94	.96
Kenya	.83	.88	.92	.94	.82	.85	.92	.96
Lesotho	.73	.76	.86	.88	.71	.76	.79	.85
Malaysia	.81	.90	.94	.94	.77	.87	.94	.96
Mexico	.83	.92	.89	.93	.80	.86	.91	.93
Nepal	.75	.79	.90	.93	.70	.76	.90	.92
Pakistan	.81	.86	.93	.93	.80	.85	.91	.94
Panama	.77	.90	.94	.89	.73	.87	.86	1.0
Paraguay	.75	.86	.87	.91	.73	.82	.80	.86
Peru	.79	.87	.93	.97	.75	.84	.90	.97
Philippines	.82	.91	.92	.96	.79	.84	.91	.91
Republic of Korea	.77	.91	.96	.97	.69	.88	.92	.94
Sri Lanka	.80	.90	.89	.88	.77	.83	.87	.88
Syrian Arab Republic	.85	.90	.95	.99	.82	.88	.95	.96
Trinidad & Tobago	.71	.89	.81	.81	.74	.87	.93	.90
Venezuela	.74	.71	.88	.88	.73	.83	.86	.94

Country	Parity 4				Parity 5			
	Both survived	1st died 2nd survived	1st survived 2nd died	Both died	Both survived	2nd died 3rd survived	2nd survived 3rd died	Both died
Bangladesh (WFS)	.75	.83	.89	.89	.73	.74	.86	.92
Colombia	.76	.84	.90	.92	.74	.83	.85	.92
Costa Rica	.75	.87	.92	.85	.76	.89	.87	1.0
Dominican Republic	.76	.88	.88	.82	.74	.83	.85	.91
Fiji	.76	.80	.91	.79	.71	.71	.85	.94
Guyana	.77	.84	.89	.80	.77	.86	.86	.70
Haiti	.74	.75	.86	.79	.71	.73	.81	.85
Indonesia	.72	.77	.86	.94	.68	.75	.83	.90
Jamaica	.75	.77	.76	.80	.74	.72	.90	.89
Jordan	.82	.89	.95	.94	.83	.90	.93	1.0
Kenya	.80	.87	.95	.92	.76	.84	.89	.96
Lesotho	.68	.69	.81	.86	.64	.72	.87	.82
Malaysia	.76	.88	.88	.91	.73	.81	.91	.96
Mexico	.80	.83	.94	.96	.80	.83	.88	.96
Nepal	.67	.71	.84	.90	.63	.69	.82	.87
Pakistan	.78	.82	.88	.92	.74	.82	.87	.91
Panama	.73	.89	.84	.94	.71	.84	.77	.69
Paraguay	.77	.83	.83	.81	.73	.86	.94	1.0
Peru	.74	.83	.88	.97	.72	.83	.91	.92
Philippines	.77	.81	.91	.96	.76	.82	.86	.90
Republic of Korea	.62	.77	.89	.91	.57	.76	.82	.97
Sri Lanka	.75	.78	.85	.90	.72	.78	.83	.88
Syrian Arab Republic	.81	.89	.93	.96	.78	.90	.92	.96
Trinidad & Tobago	.72	.91	.93	.75	.71	.92	.77	.73
Venezuela	.71	.85	.88	.88	.71	.82	.82	.44

Table 7. Differences between additional children for women who had i and i-1 survive and death of i, i-1th or both children

Country	i = 2+	i = 3+	i = 4+	i = 5+	Country	i = 2+	i = 3+	i = 4+	i = 5+
Bangladesh (WFS)					Mexico				
i died	-0.44	-0.50	-0.39	-0.49	i died	-0.42	[-0.65]	[-0.70]*	[-0.51]*
i-1 died	-0.40	-0.39	-0.11	0.00	i-1 died	-1.00	-0.38	-0.47	[-0.19]
i and i-1 died	-1.01	-0.68	-0.65	-1.26	i and i-1 died	[-1.88]	[-1.94]	[-0.47]	-1.38
Colombia					Nepal				
i died	-1.26	-1.15	-1.11	-1.00	i died	-0.81	-0.32	-0.63	-0.61
i-1 died	-0.79	-0.81	-0.87	-0.93	i-1 died	-0.23	-0.21	-0.04	-0.34
i and i-1 died	[-1.40]	[-2.45]	[-0.90]	[-1.39]	i and i-1 died	-0.96	-1.21	-0.90	-0.98
Costa Rica					Pakistan				
i died	-1.24	-1.67	-0.88	-0.49*	i died	-0.76	-0.51	-0.48	-0.76
i-1 died	-1.68	-0.69	-1.22	-0.70	i-1 died	-0.52	-0.33	-0.45	-0.51
i and i-1 died	[-3.35]	[-2.33]	[-0.46]	[-0.78]	i and i-1 died	-1.01	-1.25	-0.82	-0.24
Dominican Republic					Panama				
i died	-0.18*	-0.03*	-0.36*	-0.51*	i died	-1.15	-1.03	-0.85	[-0.06]
i-1 died	-0.43	-0.09	-0.34	-0.40	i-1 died	-1.33	-0.59	-0.85	-0.98
i and i-1 died	[-1.24]	[-0.38]	-1.34	-0.64	i and i-1 died	[-1.68]	[-1.96]	[-2.77]	[+0.18]
Fiji					Paraguay				
i died	-0.01	-0.84	-0.72	-0.36*	i died	-0.55*	-0.31*	[-0.38]*	[-0.40]*
i-1 died	-0.99	-0.75	-0.63	-0.34	i-1 died	-0.47	-0.18	-0.63	[-0.47]
i and i-1 died	[-1.82]	[-0.59]	[-0.33]	[-0.51]	i and i-1 died	[-0.37]	[-2.19]	[-1.08]	[-0.92]
Guyana					Peru				
i died	-1.06	-0.43	-0.69	-0.55	i died	-1.08	-0.92	-0.75	-0.98
i-1 died	-1.03	-0.74	-0.60	-0.81	i-1 died	-0.95	-0.67	-0.56	-0.52
i and i-1 died	[-0.81]	[-1.47]	[-1.08]	-0.94	i and i-1 died	-2.23	-1.70	-1.46	-1.28
Haiti					Philippines				
i died	-0.14*	-0.36*	-0.38*	-0.41*	i died	-0.76	-0.79	-0.48	-0.58
i-1 died	-0.21	0.02	-0.07	-0.19	i-1 died	-0.99	-0.57	-0.51	-0.12
i and i-1 died	[-0.01]	[0.25]	[-0.21]	[-0.15]	i and i-1 died	[-1.60]	[-1.39]	[-0.78]	[-0.92]
Indonesia					Republic of Korea				
i died	-0.67	-0.57	-0.78	-0.77	i died	-1.38	-1.24	-0.79	-0.64
i-1 died	-0.53	-0.68	-0.16	-0.60	i-1 died	-1.09	-1.04	-0.56	-0.42
i and i-1 died	-1.32	-1.03	-0.98	-1.44	i and i-1 died	[-1.48]	[-1.02]	[-1.96]	[-1.29]
Jamaica					Sri Lanka				
i died	-0.77	-1.15	-0.12	[-1.09]	i died	-0.43	-0.25*	-0.17	-0.24
i-1 died	-1.17	-1.21	-0.60	[-0.54]	i-1 died	-0.47	-0.23	-0.02	-0.02
i and i-1 died	[-0.70]	[-1.53]	[-2.81]	[-0.27]	i and i-1 died	-0.43	[0.02]	[-0.38] a/	-0.35
Jordan					Syrian Arab Republic				
i died	-1.76	-1.10	-1.03	-0.93	i died	-1.17	-1.30	-1.23	-1.01
i-1 died	-1.35	-1.34	-1.19	-0.54	i-1 died	-0.87	-0.77	-0.96	-1.05
i and i-1 died	-2.28	[-2.20]	[-1.17]	[-1.11]	i and i-1 died	[-2.16]	[-1.96]	[-1.87]	[-0.90]
Kenya					Trinidad & Tobago				
i died	-0.53	-0.49	-1.03	-0.46	i died	-0.98	-1.30	[-1.46]	[-0.41]
i-1 died	-0.64	-0.35	-0.38	-0.65	i-1 died	-1.55	-1.13	-0.84	[-1.07]
i and i-1 died	-1.40	-1.42	-1.23	-1.01	i and i-1 died	[-2.17]	[-1.21]	[-0.49]	[-0.22]
Lesotho					Venezuela				
i died	-0.58	-0.13	-0.63	-0.38	i died	-0.88	[-0.43]	-1.02	[-0.48]*
i-1 died	-0.18	-0.31	-0.05	-0.35	i-1 died	-0.04	-0.92	[-0.06]	-0.70
i and i-1 died	-1.11	[-1.15]	[-0.75]	[-0.73]	i and i-1 died	[-5.06]	[-1.58]	[-0.11]	[+0.14]
Malaysia									
i died	-1.13	-1.19	-0.93	-0.63					
i-1 died	-1.20	-0.68	-0.72	-0.49					
i and i-1 died	-1.30	[-1.67]	[-0.92]	[-1.12]					

Note: [] = less than 50 cases

* Fertility is not significantly different between mortality experience groups at the indicated parity.

Table 8. Effects of infant mortality on fertility: reduction in births due to a reduction in deaths

Country	Effect of previous child death on achieved parity from regression <u>a/</u>						Weighted average of effects from regression for 2+, 3+, 4+ and 5+	Birth interval effects from mean intervals <u>b/</u>	
	Parity 2+		Parity 3+		Parity 4+			Neonatal	Post-neonatal
	D _i	D _i - 1	D _i	D _i - 1	D _i	D _i - 1			
Bangladesh (WFS)	0.463*	0.288	0.389*	0.386*	0.408*	0.213*	0.368	.219	.159
Colombia	0.718*	0.365*	0.802*	0.612*	0.546*	0.647*	0.558	.177	.111
Costa Rica	0.874*	0.957*	1.003*	0.625*	0.485	0.727*	0.739	.217	.239
Dominican Republic	0.219	0.229	0.207	0.305	0.489	0.827	0.367		.217
Fiji	0.435*	0.529*	0.460*	0.297*	0.337	0.453*	0.436	.145	.128
Guyana	0.528*	0.396*	0.325	0.677*	0.490*	0.558*	0.504	.323	.185
Haiti	0.408*	0.214	0.226	0.185	0.365	0.066	0.251	.236	.081
Indonesia	0.621*	0.511*	0.442*	0.660*	0.662*	0.263*	0.553	.261	.252
Jamaica	-0.079	0.536*	0.112	0.206	0.249	0.450	0.274	.204	.179
Jordan	0.968*	0.683*	0.654*	0.838*	0.694*	0.771	0.727	.249	.120
Kenya	0.279*	0.428*	0.422*	0.365*	0.695*	0.298*	0.428	.220	.187
Lesotho	0.558*	0.344*	0.289*	0.475*	0.577*	0.296*	0.422	.351	.281
Malaysia	0.554*	0.606*	0.659	0.497*	0.621*	0.328*	0.526	.219	.146
Mexico	0.341	0.783*	0.345	0.356	0.265	0.043	0.375		
Nepal	0.705*	0.341*	0.458*	0.472*	0.652*	0.196*	0.476	.152	.182
Pakistan	0.542*	0.454*	0.547*	0.405*	0.480*	0.457*	0.471	.238	.191
Panama	0.604*	0.749*	0.635*	0.442*	0.704*	0.692*	0.551	.152	.135
Paraguay	0.464	0.429	0.201	0.268	0.274	0.580*	0.387		.225
Peru	0.552*	0.541*	0.502*	0.397*	0.412*	0.386*	0.474	.220	.223
Philippines	0.495*	0.581*	0.534*	0.415*	0.467*	0.387*	0.470	.253	.175
Republic of Korea	0.545*	0.417*	0.836*	0.468*	0.787*	0.589*	0.589	.325	.236
Sri Lanka	0.214	0.082*	0.170	0.137	0.109	0.053	0.138	.190	.209
Syrian Arab Republic	0.802*	0.690	1.004*	0.575*	1.030*	0.855*	0.808	.202	.214
Trinidad & Tobago	0.352	0.867*	0.697*	0.679*	0.733	0.382	0.610	.317	.016
Venezuela	0.840*	0.383	0.471	0.863*	1.013*	0.027	0.593		.111

* Significant at 5 per cent

a/ Controlling for age of mother, rural residence, wife's education, husband's occupation and wife's work status.b/ Calculated from weighted means at parities 2, 3, 4, 5 and 6.c/ D_i = death of ith childd/ D_i - 1 = death of i - 1 child

Table 9. Cost per user and per birth averted using various estimation techniques

Country	Cost per user <u>a/</u> (\$)	Births averted per user		Cost per birth averted	
		Low estimate	High estimate	Low	High
					(\$)
Bangladesh	20.71	.265	.282	73	78
Colombia	4.88	.233	.327	15	21
Costa Rica	15.95	.140	.310	51	114
Dominican Republic	12.26	.249	.336	36	49
Indonesia	8.60	.187	.243	35	46
Jordan	22.47	.293	.357	63	77
Kenya	71.61	.259	.287	250	276
Malaysia	14.90	.226	.302	49	66
Mexico	15.55	.278	.368	42	56
Nepal	57.16	.220	.242	236	260
Pakistan	10.50	.182	.190	55	58
Panama	25.60	.155	.263	97	165
Peru	7.02	.259	.294	24	27
Philippines	13.98	.255	.308	45	55
Republic of Korea	8.44	.154	.220	38	55
Sri Lanka	5.60	.192	.250	22	29

a/ USAID figures for 1980 adjusted for new user rates for all countries except Jamaica, Jordan, Kenya and Pakistan. Figures for Peru are for 1979, so that no update is needed.

Table 10. Cost per death prevented

Author	Method	Country	Cost per death prevented \$
Shepard (1982)	Measles immunization (includes all joint costs of a programme of polio, DPT, BCG and tetanus)	Ivory Coast	490
Barnum et al. (1980)	Total immunization programme	Indonesia	130
	BCG only		445
	DPTT only		135
	BCG marginal		101
	DPTT marginal		77
Barlow (1976)	Mass vaccination	Morocco, 1971	
	BCG		24
	DPTT		38
	Polio		1 100
Barnum (1980)	Immunization total	Kenya	85
	DPT, TT, BCG only		274
	Measles only		50
	Polio only		6 357
	DPT, TT, BCG		69
	Measles as marginal		26
	Polio as marginal		568
	New births only		70
	Implementation marginal		113
	all immunization		
	Implementation marginal		1 375
	DPT, BCG, polio		
Barnum (1979)	Health programme separate	Nepal	508
	Integrated with family planning		271

Table 10 (continued)

Author	Method	Country	Cost per death prevented
Faruqee & Johnson (1981)	Nutrition programme	Narangwal	7.75
	prenatal		
	Health care - infant		25
	- child		31
Barlow (1976)	Hospital	Morocco, 1971	
	Large		2 640
	Medium		2 820
	Small		2 360
Horton & Claquin (1982)	Hospital treatment for	Bangladesh	
	diarrhea		
	Sotaki		187
	Matlab		1 262- 1 352
Prescott (1980)	Malaria eradication	Bangladesh	809-25 090
	Spraying and drugs		
Walsh & Warren (1979)	Mosquito control -	Cross-country analysis	600
	malaria (infant and		
	child)		
	Community water supply,		3 600- 4 300
	sanitation		
	Selective primary		200-
	health care		250

Table 11. Cost per birth averted through preventing an infant death
(US dollars)

Country	Lowest cost <u>a/</u>	Highest cost <u>b/</u>	Cheapest country-specific
Bangladesh	679	1 572	508 (Sotaki hospital)
Colombia	448	2 252	
Costa Rica	338	1 152	
Dominican Republic	681	1 152	
Guyana	496	1 351	
Haiti	966	3 086	
Indonesia	452	992	244 (DPTT programme only); 139 (DPTT marginal)
Jamaica	789	1 397	
Jordan	344	2 083	
Kenya	584	1 337	117 (measles only); 61 (measles marginal)
Lesotho	592	890	
Malaysia	475	1 712	
Mexico	667	1 316	
Nepal	525	1 645	569 (Integrated family planning MCH)
Pakistan	531	1 309	
Panama	454	1 852	
Paraguay	646	1 111	
Peru	527	1 136	
Philippines	532	1 429	
Republic of Korea	424	1 059	
Sri Lanka	1 196	1 316	
Syrian Arab Republic	309	1 238	
Trinidad & Tobago	410	5 625	
Venezuela	422	2 252	

a/ Estimated with \$ 250 per death averted and highest impact of mortality on fertility.

b/ Estimated with \$ 250 per death averted and the smallest impact of mortality on fertility.

III. MARRIAGE, FAMILY ROLES AND FERTILITY

A. Fertility and family structure

Norman B. Ryder*

SUMMARY

This article begins with the proposition that to date the considerable efforts made to understand the determinants of fertility decline have been less than successful because disproportionate emphasis has been placed, in concepts and surveys, on the problem of explanation at the individual level. The institutional setting, which always and everywhere conditions individual decisions and behaviour, has been consigned to residual neglect.

The last half of the article contains an account of those aspects of modernization which seem to have the most direct implications for family structure. The account begins with a description of the intergenerational contract, and the way in which mortality decline affects the parties to that contract. The conclusion is that mortality decline is disruptive of both the quantitative and the temporal equilibrium within the traditional family, because of an increase in the ratio of sons to fathers and a delay in the time of transfer of statuses and rights from the senior to the junior generation.

As the author believes that the assumptions about family relationships, as conveyed by the nature of the intergenerational contract, are the primary determinants of fertility, this account of modernization as a force for demographic change is focused not so much on fertility itself, but on those assumptions, i.e., on the system of family morality. The discussion is strongly derivative, in somewhat amended and abbreviated form, from Caldwell's theory of fertility decline.

The position of the author is that the need for policy arises from the fact that the pursuit of family interests yields consequences that are unsatisfactory for society in the aggregate, because some of the costs incurred by the senior generation are displaced unto the junior generation. Several policy suggestions are developed in relation to the potential effect on fertility of certain socio-economic strategies.

* Professor of Sociology, Princeton University, and Office of Population Research, Princeton University, Princeton, New Jersey, USA.

In conclusion, it is believed that an acceptable theory of fertility decline is probably inaccessible within the confines of mechanistic micro-analytic models. It should be admitted, however, that a start has been made to define the macro-analytic problem in such a way as to suggest what the appropriate research concepts and instruments should be. The basis for firm recommendations for scientific investigations and for policy is likely to be a theory of social change.

In the past several decades there has been a large expenditure of professional and material resources on the problem of the determinants of fertility decline. Notwithstanding this effort, which has indeed led to a substantial increase in information, there has been little advance in understanding. Of the many diagnoses which might be proffered to explain our lack of success, the one most cogent is that a disproportionate share of our time has been allocated to one style of research. The center-piece of most of our attention has been the individual decision-maker, and the socio-cultural context of reproduction has tended to be relegated to a residual environmental limbo. The failure to provide the base of responsible knowledge required to inform social policy may be attributable to the fact that questions are asked at the wrong analytic level.

A theory of fertility decline is but one element in a theory of social change. The conceptualization required for that differs categorically from the design of most current demographic inquiry. A theory of social change is concerned with the transformation of institutional structures. Metaphorically, the kind of thinking is much more like that employed by anthropologists and biologists than like the mechanistic formulations (borrowed from physics) from which most social and economic research is derivative. No claim is made to provide the necessary alternative conceptualization here. At best, this paper provides a set of suggestions for ways in which something important may be learned by pointing the investigations in other directions. Nor can there be much pride of originality. In recent years, similar positions have been expressed by many contributors to the literature. The most evident intellectual debt is to the work of Jack Caldwell. In addition, it will be evident to Geoffrey McNicoll and Ron Lesthaeghe, among many others, how influential their writings have been.

The complexity of the structural context within which reproduction is embedded is such that a comprehensive treatment would have exceeded reasonable bounds for this essay as well as the competence of the author. Instead, one particular theme has been pursued with some persistence. Intrinsic to the study of social change is the passage of time. The most promising link between family structure and social change (and accordingly fertility change) is the time dimension of the family, its generational structure, as it changes through time.

DISTINCTIONS BETWEEN ANALYTIC LEVELS

The thinking about fertility has proceeded along two distinct lines, one focused on characteristics of individuals, and the other on characteristics of the groups of which individuals are members. Research of the former kind, called micro-analytic inquiry, has tended to emphasize measurement of the relationship between a dependent variable and each of various independent variables, whereas research of the latter kind, called macro-analytic inquiry, is more inclined to ask questions about structure and interdependence, although this distinction is not a sharp one. Family structure, the particular emphasis of the present contribution, is clearly a macro-analytic subject. Nevertheless, because the dominant style of empirical inquiry has been oriented to the individual, it is important to consider how amenable the subject of fertility is to micro-analytic research.

Demographers study the characteristics of populations on the basis of observations about individual members, and particularly events occurring to those members which change the size of populations. It is accordingly not surprising to find two polar types of models constructed to organize the evidence, one centered on the individual and the other on the aggregate. The significance of the orientation selected is the distinctive recipe for the research that emerges.

The question that justifies governmental support of fertility research is the set of determinants of the birth rates of successive cohorts in successive periods for populations variously characterized. The shape of fertility as a function of age and time is the critical input into projections of the size and age distribution of the population. The manifold consequences of the indicated changes provoke consideration of interventions that may modify the outcome in directions contributing to the attainment of societal goals.

Notwithstanding the policy priority of aggregate outcome, most research has in fact been directed to the characteristics of individuals. Although a defensible case may be made for assigning theoretical priority to that line of inquiry, rather than to examination of the social arrangements within which individuals find themselves, in the view of the author, the predominance of this style has arisen less from reasoned debate on the issues than from intrinsic characteristics of the discipline of demography. In a strict sense, demographers are atheoretical. Their objects of study are concrete entities and events rather than some particular class of analytic elements abstracted from those entities and events. The resultant pragmatic and empiricist bias has pulled demographers towards the study of available data sets, often produced for non-scientific (administrative) purposes, and typically multidisciplinary if not non-disciplinary in design. Demographers are much less comfortable with concepts than with data.

A typical account of fertility (for example, the chapter on that subject in United Nations, 1973) begins with the total fertility rate, and employs an accounting scheme to distinguish the analytically separated directions of

influence on that rate, based on a typology of the so-called intermediate variables. This typology (Davis and Blake, 1956) has been very influential in research design and in conceptualization. It provides a comprehensive checklist of the pathways along which influences on fertility must flow, keyed to the phases of the physiological process. The measurement of fertility has developed impressively by progressive quantification of the separate components, essentially as a specialized branch of biometry, relatively independent of social science considerations (Bongaarts, 1982).

For present purposes, the crucial step in the process, from the standpoint of research agenda, is the distinction drawn, in the discussion of the components of fertility, between intentional and unintentional behaviour, or between voluntary and involuntary determinants. The choice of terms specifies that the individual decision is central, and the rest is residual. Now this may be thought of as convenient shorthand for distinguishing the analytic assignments of the behavioural scientist and the biologist, respectively. A comparable role has been played by the concept of natural fertility (Bongaarts, 1982). The idea behind that concept is the distinction between reproductive behaviour which is parity-dependent, i.e., based on the intention to terminate fertility by appropriate means upon attainment of a particular parity, and all other behaviour, considered as "natural". Yet the latter does not accord in content with the distinction, say, between the natural and the social sciences. Included in the category of natural fertility are variations in fertility over space and time dependent on patterns of marriage, divorce and remarriage, customs of institutionalized abstinence in particular circumstances, lactation behaviour, and the conditional tolerance of fertility regulation in extreme situations not explicitly associated with parity. In the same way, the residual category of involuntary or unintentional behaviour is the repository not only of physiological differences but also of whatever sources of influence on individual behaviour result from the circumstance that the individual is affected by membership in one or another kind of social group.

The involuntary residual category may be thought of as a relatively invariant set of conditions, providing the setting within which voluntary acts, the manifestations of individual decisions, are carried out. Whether these conditions are biological or socio-cultural, the research implication is that they provide the background before which the individual actor stands. This is standard research strategy. One engages in a conceptual experiment, pretending that some variables are in fact constants, in order to focus on the role played by other variables, and deal with them more efficiently. There may also be empirical support for such a view, because of the time frame of the analysis. It would not be implausible, for example, to characterize the physiological elements in the reproductive process as being of secondary significance in those intersocietal and intertemporal variations in the fertility pattern that are of prime interest. Such would not be the case, however, for that part of the residual reflecting marriage, for example, since that shows substantial variation over space and time.

As so often happens with analytic distinctions, the conceptual tidiness is deceptive. For example, a fertility difference between two populations may be attributed to the physiological difference in the probability of conception during a single unprotected act of coitus without commitment to the position that such a difference is innate. The analytic question may be compared with that of a classification of deaths by cause, from a medical standpoint, which may be only a preliminary to an investigation of causes on other levels, such as the socio-economic level.

A comparable problem, more directly related to the present topic, is what is involved in identifying a particular behaviour pattern as intentional or as customary. If, for example, a respondent reports two years of lactation, the reason for that behaviour may be given as custom, without further specification. On the other hand, the respondent may be sufficiently introspective to volunteer the further opinion that the custom of extended breast-feeding contributes to the infant's health. After all, customs ordinarily make sense, at least in the double negative sense that, if they were harmful, there would have been selection against their continuation. The question is whether the recognition by the informant of some sense behind the custom transforms the act from the customary to the intentional side of the ledger.

The conventional practice has been to make the distinction between intentional and unintentional behaviour by type of activity rather than by whatever reasons may be given for it, so that contraception and abortion fall into the former and lactation and marriage into the latter category. The principal consequence of the intermediate variable typology has been the development of data and theory focused on an explanation of the intentional behaviour of individuals to the neglect of those macro-analytic elements falling into the "unintentional" class. For example, there is now substantial evidence concerning cultural variations in nuptiality, and in lactation practices, but the development of an explanatory scheme for either, in terms of other characteristics of the culture, has scarcely been addressed.

Parenthetically, there is more than a little irony to the intellectual history of the intermediate variable typology. Davis and Blake, who developed the framework, are prominent representatives of a socio-cultural orientation to fertility analysis. They used the typology originally to pose questions about the alternative strategies which may be followed by different kinds of society with respect to the range of values of each of the instrumental variable sets, and the macro-analytic correlates of those strategies. The profession has used their contribution to move in another direction.

A major reason for this outcome has been the dominant position in research, over the past generation, of the fertility survey. The objective of a typical survey is to interview a set of female respondents, selected for reasons of economy and discretion from the universe of those who are presumed to have been exposed to risk, and ask questions about their reproductive behaviour, and especially about whatever actions they may have taken to interfere in the outcome of that behaviour. Such surveys have provided rich

descriptions of the complex process of reproduction in various socio-cultural contexts; their yield of data is indispensable to the task of fertility analysis. But the question here is how the variations are to be explained. The form of the survey promotes a micro-analytic approach to explanation. Typically, the individual's environment is treated as a set of conditions. The observation that completed parity differs for rural or urban populations, for various ethnic subcultures, and the like, is not so much a solution as the rephrasing of a problem. But the availability of many bits of information for each individual, one subset of which may be called the dependent variable (at least in the sense that it represents the rationale for the research endeavor), provides ample opportunity, on the other hand, for the exercise of analytic skills at the individual level, as by the social psychologist, by the micro-economist, as well as by the statistician (not otherwise specified).

A MICRO-ANALYTIC MODEL

A model of consumer choice has the characteristic form most often employed in the analysis of decision-making. The individual is the unit of analysis. The objective of actions by the individual is to maximize his or her utility. Individuals engage in a rational and systematic effort to achieve goals, subject to certain finite constraints such as income and time. (Economists do not concern themselves with the sources of ends or the availability of means, but rather with the calculus of decision implicit in their confrontation. Ends represent data in the same sense as others given like technological feasibility.) The child may be thought of as a durable good yielding utility over an extended period, at the cost of parental time and other resources (Jones 1982). The decision-maker assesses the costs and benefits of having an additional child. The costs are conventional expenses and foregone opportunities. The benefits may be restricted to the child as a consumer good or extended to the child as a producer good as well, i.e., a source of family income either on a sustained basis during the child's early adulthood and the parents' old age, or on an emergency basis in times of special need (Robinson and Harbison, 1980). The outcome is completely determined by a sufficiently comprehensive view of the costs and benefits of the act to the individual decision-maker.

Some aspects of the intellectual approach may be exemplified by using the device of the regression equation:

$$y = c_0 + c_1x_1 + c_2x_2 + \dots$$

The dependent variable, y , on the left-hand side of the equation, is the reproductive decision. On the right-hand side, some particular independent variables (x 's) are specified, while the values of the coefficients (c 's) are the outcome of the statistical procedure. The independent variables selected are operationalized elements of the situation, such as the prices of goods and services associated with child-rearing and with other activities; the values of the coefficients stand for all other conditions of consequence in the

observational situation. The independent variables are selected not so much because they are considered primary in importance as because they are measurable aspects of those elements which are the disciplinary preoccupation of the model-builder, permitting a focus on the implications of some kinds and sources of variation in abstraction from others.

The conditions underlying the coefficients of the regression equation are not unlikely to change over time, and differ from one culture to another. In order to adapt the model so that it can address the question of the consequences of such variations explicitly, attempts have been made to incorporate some subjects in which demographers and sociologists have expressed considerable interest - in a sense to transfer them from the status of contributions to the values of the coefficients into the status of independent variables with an explicit role in the regression. One such effort (Easterlin, 1978) deserves particular attention because it has provided the conceptual basis for a major work recently undertaken under the aegis of the United States National Academy of Sciences to summarize the determinants of fertility in developing countries.

The system of variables in that adaptation of the Easterlin model is as follows. Fertility is determined by the combination of the practice of fertility regulation and "supply" of children. The latter term signifies the number of children which would be physiologically feasible for a couple, in the context of cultural practices (provided they are not parity-specific) which affect that number. The effect of the definition is to produce an approximation of what was identified above as "natural" fertility. The practice of fertility regulation in turn is based on a weighing of the motivation to regulate against the costs of fertility regulation. The motivation to regulate derives from a comparison of desired and actual parity. Finally, desired parity is the outcome of a subjective weighing of tastes and constraints by the couple, where tastes are the preferences for children relative to other goods and services and constraints are the prices of children relative to those of other goods and services, within the budgetary constraints of income and wealth.

The external elements that go into the fertility decision are the demand for children (tastes), the supply of children (natural fertility), and the costs of fertility regulation. These elements are conceptually formulated so that each is defined with the other two held constant. While this precaution does make the theoretical system tidy, some skepticism is warranted about whether the decision-maker can perform the same conceptual experiment when asked questions about the separate elements in this way.

The principal non-behavioural question in the model is desired family size. This is a most attractive and convenient variable for an analysis in which the information is to be algebraicized. It simplifies research because it appears to permit one to collapse the entire complex of institutional considerations bearing on the decision-maker into a single summary number. One is enabled to ascertain the priority accorded to parenthood in the respondent's life plan in abstraction from the particularities of the moment.

Most respondents provide an answer to the question without apparent difficulty. And the outcome has immediate policy relevance. If desired parity is lower than actual parity, one is prompted to propose programmes to reduce the costs of fertility regulation; if desired parity is higher than actual parity, the preferred direction of action is motivational. The parity norm for a couple is a policy target in the same sense that the nation has a target in terms of population size.

Yet a family, like a nation, may not think of population size as a goal, but rather as a means (among various others) to achieve goals. There may be no such quantitative dimension to the life strategy of the respondent, or it may be one aspect of a complex design. To interpret the response, one needs to know what assumptions were made about other aspects of the respondent's life, all of which are means to achieving unspecified goals. Presumably the number reported is conditional on unspecified assumptions about the rights and responsibilities of many relevant others, within and beyond the family, together with perceptions of opportunities for education, for employment and the like. The parity norm has a kind of unreality because it can scarcely exist in disembodied form apart from those perceived conditions. The respondent has the challenging task of evaluating the number of children in abstraction from the stuff of her life; the analyst has the challenging task of divining what the question may have signified to the particular respondent.

In the typical survey, the respondent to the question about desired family size is a married woman. Little information has been collected concerning what responses her spouse might make. Most analysis appears to proceed on the assumption that the respondent is a neutral representative of a pair who always think and act in harmony. Little is known about the nature of the bargaining process by which some resolution is achieved if the couple disagree (Arthur, 1982). Clearly the respective discretionary powers of husband and wife differ from one culture to another (to the extent that the desires of the wife may be nearly irrelevant to the decision), and the power of the kinship group may be sufficient to reduce substantially the discretionary role of the couple even when they agree (Hawthorn, 1978). In brief, the link between desire and action may be tenuous if the respondent is not the responsible party.

Nor is the problem simply one of conflict of interest among the affected parties. In formulating a response, the informant may be putting her personal interests to the forefront, she may give heavy weight to the perceived interests of her husband, or she may think that the interests of the prospective children deserve priority. The respondent is a representative of a system of role relationships. It may be beyond her capabilities to articulate that system, given the way in which the internalization of norms yields a co-mingling of individual purpose and group design, but even if not, the reliability of the report would be questionable because of the particular position she occupies within that system.

Underlying the parity norm - if one assumes that it is more than a convenient artifact in the mind of the analyst - is an assessment of the costs and benefits of children. There are many complexities to that assessment.

Thus the time spent on child-rearing is from one viewpoint a cost because it represents foregone opportunities, but from another viewpoint it is a benefit, since it is the vehicle through which many of the satisfactions of child-rearing are derived. Also, the characteristics that make it possible for the child to be a source of pleasure are the same as those that make it possible for the child to be a source of pain. As a third example, acceptance of the burdens of child-rearing is a way to achieve the important pleasure of success in fulfilment of a moral obligation.

At the most mundane level of criticism, the particular wording of the question used to obtain the desired parity response is biased in favour of marriage rather than non-marriage, and biased in favour of a family (including children) rather than a childless couple, and finally biased in favour of children in the plural relative to a response of one child. Such considerations doubtless constitute part of the explanation for response distributions in every survey which have an effective floor of two children. Beyond this, there is the perplexing problem of reliability of any response to a question with a normative overlay, because of the tendency to misstate in the direction of what the respondent perceives the interviewer (and the powers he or she represents) to regard as proper.

In the conceptual system employed by the National Academy of Sciences project, norms are ubiquitous but implicit. With respect to desired parity, norms appear as a component of "tastes". Although strange to the uninitiated, the term has long standing in micro-economic models of consumer choice. It serves to indicate the direction of research required to give it content, presumably a psychological inquiry into the characteristics of the individual. If so, the term is peculiarly inappropriate for a normatively oriented facet of the response, since norms are not individual characteristics but properties of groups. Norms are shared expectations about how persons should behave in relationship systems. To ascertain group properties the level of inquiry is not the socio-psychological but the socio-cultural.

Norms also are introduced into the conceptual scheme as elements in the costs of regulation. Analytically, one may think of norms as standing for particular kinds of cost and benefit, in the sense that they are given force by positive and negative sanctions (Robinson and Harbison, 1980). Now the question of fertility regulation is logically prior to that of the reproductive goal. The responsiveness to a question about the parity norm implies acceptance of the legitimacy of modifying parity by intentional use of some mode of fertility regulation. In some cultures, the reproductive policy is not so much an injunction to bear a particular number of children as an injunction not to interfere at all in the process. Yet if the acts which would be appropriate given the specification of a parity goal are immoral, the question about that parity goal is inappropriate if not improper, and the response is misleading if not meaningless. More likely is a continuum of orientations to the appropriateness of fertility regulation by one or another means, raising the complex problem that the means considered legitimate may be those with a high cost relative to their perceived efficacy.

The reason for emphasizing the difficulty of ascertaining from the individual the weight of the norms bearing on responses to particular questions such as tastes, and the psychic costs of regulation, is that, if those elements cannot be measured, they tend to be given whatever values are necessary to explain the observed behaviour - in effect collapsing the conceptual scheme into a tautology on those dimensions - or they are considered to be constant for the purposes at hand, effectively eliminating them from the system of variables except as verbal window-dressing.

The final problem concerning the conceptual scheme adopted by the National Academy of Sciences is the extent to which, quite aside from the foregoing objections, the scheme suffices to provide a comprehensive answer to the question of fertility as a function of age and time. The approach is oriented to the explanation of marital parity. This neglects the necessary and interdependent question of the time pattern of fertility, and particularly its most important component, the nuptiality function. While some interesting questions may be raised concerning marriage in modernized societies, from an individualistic standpoint, the extent of the impress of custom on the pattern of marriage is substantial in the cultures of developing populations.

The center-piece of reproductive strategy may in fact not be the parity norm at all, but rather a set of time pattern norms. Lesthaeghe (1980) has drawn attention to three questions which cultures answer in different ways: when do people start reproduction, how do they space reproduction and when do they stop reproduction? Acceptance of norms with respect to these temporal dimensions of reproduction would itself have the by-product of a particular parity, as an average outcome, not in direct response to any quantitative orientation but as the indirect consequence of the time constraints themselves. It is not far-fetched to propose that the time pattern of reproduction, relative to the respondent's age and stage in the family life cycle, may be weighted more heavily than a particular population size for the family, especially if the plan is sequentially formulated.

Finally, an analytic scheme that focuses on decisions made by individuals may provide an explanation of variation among individuals in the number of children borne, as responses to particular sets of conditions, but this is a long way from an explanation of the aggregate outcome. Precise predictions of individual fertility from a regression equation would leave problematic the question of the distributions of individuals in the population concerned with respect to the variables which yield those predictions - the distribution of the population between rural and urban areas, the wage rate for women in the labour force, the level of schooling and so forth. At the individual level, these elements in the decision process must be accepted as given, but they cannot be taken for granted by the analyst with the assignment of explaining why one culture has a different pattern of fertility by age and time than another.

A MACRO-ANALYTIC MODEL OF A TRADITIONAL SOCIETY

The centre of the micro-analytic model is occupied by the individual, pursuing his or her own interests within an environment constituted of organized groups - such as the family, the community and the nation - in which costs and benefits are administered by agents of those groups to constrain the individual's actions. In the macro-analytic model, to the contrary, the group is the focus, and the requirements for survival of the group are paramount. The individual is viewed less as a decision-maker than as a servant of the society, charged with responsibilities to the group, such as the responsibility for producing replacements (in a socio-cultural as well as biological sense) for a population structure continually depleted by mortality. The individual is programmed by group processes to fill a role in the societal blueprint. Those processes to ensure that the "will" of the group will be served are socialization - the imprinting of the individual with the societal design to the point that the individual cannot perceive a distinction between selfish interests and group purposes - and social control, or the employment of positive and negative sanctions by group members to cope with the consequences of incomplete or imperfect socialization. The problem is to make individuals responsive to group interests even when they conflict with individual interests. Particularly at the subsistence level, the needs of the individual must be subordinate to those of the group as a whole; the weakling or the rebel cannot be tolerated.

The model may be most realistic as a depiction of life in a small homogeneous group, characterized by face-to-face interaction, and with little contact with alternative blueprints, but that admission should not be taken to imply its irrelevance for the understanding of larger and more complex societies. In a broader sense, there is something at least incomplete if not wrong with a model which denies free will just as there is with a model in which free will is the guiding principle. A major element in the complexity of the problem of devising a satisfactory theory of social change consists of finding complementary roles to be played by these contrasting orientations.

The central feature of a traditional society is its organization by kinship on the principle of descent. Kinship is a system of categories, and associated rights and duties, enabling persons to co-operate in an orderly social life (Eggan, 1968). Through descent, the individual becomes associated with a reservoir of relatives from whom he can expect certain kinds of conduct and vice versa. Every society defines for every individual the particular others with whom he has privileges and obligations. When he needs assistance, he turns to kin rather than non-kin.

The kinship system may be considered as a solution to problems posed by the passage of time, and individual mortality. The emphasis of its functions is the identity and solidarity of the group over time, in competition with other groups similarly constituted, and the survival of the system itself.

Vital events provoke modification of population composition. In particular, death produces a gap which demands to be filled. Kinship institutions are designed to cope with the implications of such modifications (Fox, 1967).

The evolution of the kinship system may be regarded in part as an adaptation to high and variable mortality. The individual life cycle begins and ends with phases of dependency. No social system would be viable without regularized arrangements by which productive adults are committed to the care of young and old dependents (as well as those temporarily dependent because of morbidity). The nuclear family is just such an arrangement. Yet the nuclear family does not ordinarily suffice. It has a disproportionate burden of premature dependents in its early stages and a disproportionate burden of post-mature dependents in its late stages. The two-generational design of the nuclear family, although more viable over time than the individual, still fails to balance the resources available with the resources required, over time. A further step in institutional innovation is the extended family, a residential design which yields an overlapping of individual life cycles, potentially perpetual, more closely resembling the age distribution of the population as a whole, and coming closer to being a systematization of the flow of resources from those who have more to those who need more. The extended family is a social arrangement to ensure transactions over time by preventing the departure of the junior generation when it becomes productive. The larger principle of descent, by analogy, provides a still more comprehensive supply of replacements when members die who were necessary for the care of others; on the elementary insurance principle of spreading risk, the descent group has greater viability than any of its constituent extended families.

The kinship system is closely linked with the question of property, i.e., of resources which persist over time. Descent groups are more likely to be found if there is property, perhaps in the form of land, or a house, or a grazing or fishing site, and therefore an advantage to the kind of continuity provided by an extended family system (Goody, 1968). Descent groups control all values that persist over time, all productive and reproductive resources, including succession to titles of rank. The role of the kinship system with respect to valuables that endure is closely linked with its function as a savings bank and insurance system, institutions that transfer resources through time, and thus from those in one life-cycle stage to those in another.

Associated with the centrality of time as the problem the kinship system is designed to solve is a continuing emphasis on the evaluation of behaviour in terms of its implications for persistence of the kinship system itself (Levy, 1966). This is a principal justification for the epithet "traditional". The word tends to be used to signify the absence of change (Davis, 1963). The characteristic response of a traditional society, when faced with changes in its environment, is to limit its adaptations to those that do not risk a change in the institutional structure.

Every system has a conservative potential of this kind; it is part of what is meant by "system". There is an extensive array of requisites for survival, economic, political and integrative as well as reproductive. The

societal blueprint which charts a way through the rapids is characterized by high interdependence of elements. The emphasis is on the inhibition of deviance, and on survival strategy, as distinct from maximization of success in one particular direction. The analogy is with living things, where life can be extinguished by failure in any one of many constituent parts, or processes (Farber, 1973). A subsistence society with high fertility counterbalancing high mortality is fragile, and the range of discretion is very limited. Security is sought by establishing a network of personal relations, the size of which depends on the net reproductivity of the group, extensions of the network through marriage alliances, and success in intergroup competition. In a society with a history of survival despite many disasters, the system that has persisted under such testing accumulates respect (Caldwell, 1982). Although the natural inclination of the demographer is to emphasize the reproductive aspect of survival, the highest priority should properly go to the system itself, and its capacity to reproduce itself.

The axes of family structure are generation and gender. These are categorically different in the sense that one is fixed in gender for life, whereas, given survival, one passes from one generation to the next. (Stone, 1977, captures this point by comparing them to caste and class.) Biological characteristics of the individual life cycle, specifically a long stage of prematurity, necessitate commitment, over an extended period, of a flow of resources, energy and attention from mature persons towards the child. The biological substratum of symbiosis between mother and infant is adapted and enlarged to encompass the transformation of the raw material socially as well as biologically. The dependence of the infant implies the preoccupation of the mother and therefore her need for protection from abandonment. The root of the marriage contract is the protection of women - specialized for childbearing and child-rearing - from abandonment (Fox, 1967). Consequent upon this primary specialization is a focus of women's activities inside and men's activities outside the household and so forth.

With no implication of denigrating the importance of gender differentiation for family structure and fertility, the topic is set aside in this manuscript. (There are highly competent reviews, e.g., Dixon, 1975, and Oppong and Haavio-Mannila, 1979; see also Tilly and Scott, 1978, for a fine treatment of changes in the United Kingdom and France accompanying industrialization.) On the grounds of economy of presentation, the choice here is to pursue exclusively the generational axis of the family (and thus emphasize the time dimension of the family) and to leave the important questions of gender for others. One cost of this decision is neglect of the interesting ways in which the topics merge.

A society can be defined by its institutionalization of particular cultural patterns. The necessity of internalizing those patterns in the oncoming generation is second in importance only to maintenance of adult levels of participation (Parsons, 1968). The family is the conduit by which culture is kept alive. Through socialization, individuals come to want to do what must be done if the society is to persist, acquiring the skills and attitudes requisite to performance of future adult roles. Because so much of

the capital of the society is its culture, the possession of the adult members of the society with which the children become endowed as they become adults, the seniority system prevails.

There is clear demarcation between successive generations. The elders are the physical progenitors of the young, they protect and nurture them during their childhood, and provide their training in the crafts, customs and morals of the group (Fox, 1967). The participation of the father in the human family rests partly on economic specialization and complementarity, but partly on the body of lore to be transmitted to the junior generation. Parents socialize children, serve as models for them, ascribe parental status to the child, and exercise control through the panoply of sanctions they command. Parental control is authoritarian and oriented to the common good as the parents perceive it. The household is the center of strictest inequality. The training of the younger by the older generation for adult roles reinforces the structure of authority more generally (Levy, 1966). Intergenerational authority and obedience are generalized by age. Where one sees one's contemporaries as individuals with whom a friendship relation can exist, the elders are representatives of the system being imposed from above. The emphasis on discipline and supervision is further justified by the formidable task of control in a society in which the age distribution is disproportionately young. The equity and reciprocity which leavens the system is the expectation of rising from the bottom to the top of the authority system with the passage of personal time.

A traditional society has a low level of technology and a low level of productivity. Beyond the content of the culture, capital consists of land and, in a sense, women (since they represent not only labour but also the means to produce future labour). The scarce factor of production and the main source of energy is human labour. The only way to increase production is to increase numbers. Accordingly, no restriction of fertility is to be expected under normal circumstances.

Those responsible for the care of their children before they become productive may be more impressed with the costs than the benefits during that phase of the nuclear family life cycle. On the other hand, a child costs little in a poor family, and there are many helping kinfolk. Children are raised frugally and put to work early. Caldwell (1982) depicts such a family system as exploitative in the sense that the benefits of fertility accrue disproportionately to those who make the reproductive decisions, whereas the costs are displaced on those without decision-making power, the women and the children. Accordingly he infers that it is economically rational to aim for fertility without limit. The validity of the inference depends on whether the patriarch is viewed as acting in his own interests or in the interests of the group for which he is responsible. Moreover, what is economically rational depends on whether there are resource limitations other than the size of the labour force, whether there are production costs associated with the size of the enterprise, and whether there may be problems of internal conflict and feasibility of social control associated with the size of the ratio of the junior to the senior generation. Perhaps a more defensible proposition would

be that a bias against limiting fertility derives from the ability of the decision-maker to secure many of the advantages and avoid many of the burdens of high fertility.

If one regards each society as manifested in a particular cultural design, then those systems that have survived (and are accordingly available for investigation) must have been sufficiently fertile - whatever the reason - to match the forces of mortality to which they were exposed. Institutional structures compete for survival. Those with a higher intrinsic rate of natural increase are selected relative to those with a lower rate. Cultural selection parallels genetic selection: the element in each is a unit in the form of an instruction (the gene and the norm). The evolution of cultural forms obeys rules which are analogous to those governing the evolution of the genotype, although the potential pace of the former substantially attenuates the fruitfulness of the analogy. Demographic generalization contributes to the most fundamental aspect of sociological thought: the basis of survival or extinction of types of institution and society (Davis, 1959).

The demographic transition is described as a movement from an equilibrium of high mortality and fertility to one of low mortality and fertility, with an intervening episode of disequilibrium characterized by growth, because mortality decline tends to precede fertility decline. Yet the confident description of the high equilibrium remains out of empirical reach because the context is contrary to the requirements for data collection. Its empirical plausibility rests on the insight that the average rate of population growth for the species since the beginning of time must have been approximately zero. That could follow logically from a model in which positive growth rates for some populations matched negative growth rates for others, or from a model in which positive rates for some periods were matched by negative rates for others. A general proposition is that, if the characteristics responsible for natural increase, within any subdivisions of a population, are transmitted familially (whether genetic or socio-cultural), the rate of natural increase for the total will tend to converge towards that of the subdivision for which it is highest. That would suggest a population growing under normal circumstances, but checked periodically by outbursts of high mortality, as population size exceeds the limits of its ecological niche. Yet we know so little about population history in detail that it is only discreet to keep our minds open to other possibilities (such as an institutional response in the form of preventive checks, where fertility as well as mortality play an equilibrating role, as proposed by Wrigley and Schofield, 1981).

The kinship system has so large a stake in the maintenance of its numbers that there are strong pressures to fulfill parental obligations even if those assuming the burdens of the bearing and rearing of children would otherwise regard them as outweighing the prospective benefits. The family has a contract with the kinship group to produce new members, a most important contract because it serves the continuity of the group. The obligation to produce others, to whom one owes extensive and often burdensome obligations, requires considerable social reinforcement (Goode, 1968). Given the energy and attention devoted to teaching the joys of parenthood and the blessings of

giving birth, it seems appropriate to regard this less as a celebration of the obvious than as evidence that, in the absence of such social pressure, fertility is at risk of becoming inadequate to the interests of the group.

Although adequate reproduction is evidently necessary to group survival, it is clearly insufficient. The success of one cultural form in competition with others requires that the system be viable in many other respects. The competitive position of a particular institutional structure depends on its economic and political vitality. If productivity is low, the relative strength of two systems depends heavily on their respective aggregate numbers. In this sense there is selection for those factors associated with larger population size. Power helps to determine the resources over which a particular social system has domain. Prior to the emergence of more embracing political forms, numbers were the principal guarantee of security from attack. Yet the effective strength of a society depends on solidarity and order as well as numbers. In an uncertain world, fragile systems stress order and continuity.

A larger population size can be achieved not only through fertility but also through alliances and military success. Probably all societies use additional modes of entry, beyond fertility, to increase the size of the group - by marriage, capture, recruitment and absorption (Goody, 1968). Just as the exigencies of fertility and mortality may lead to population decline and group extinction, so they may lead to population expansion. The larger the group, the greater the organizational requirements. Internal strains may become more of a threat than competition from outside, particularly given the likely circumstance that effective leadership is rare (Goode, 1968). Large memberships are hard to hold together and hard to administer.

Within a general context of strong pressure on the members of the society to reproduce, there may be more or less tolerance of exceptions, safety valves in the face of short-term emergencies. For example, child neglect, if not infanticide, may be a reluctantly accepted response in worsening conditions. From the standpoint of group survival, dependents are the most expendable since they can be replaced. In contrast with contraception and abortion, infanticide permits selection of children on some quality criterion, it is not harmful to the mother, and it requires no foresight. If one were to characterize "population policy" for a traditional society, it might take the following form: each group attempts to maximize its size, perhaps more on political than on economic grounds, as a general principle; the form of policy effort is sanctions against those attempting to limit fertility in normal circumstances, with tolerance of fertility regulation when resources become over-extended. Should the fertility which is the outcome of the system of reproductive norms turn out to be higher than mortality, and the resource base permits, the group may grow and expand its area through warfare. Increase in mortality would follow from growing pressure on resources or from defeat in war. Should fertility, for whatever reasons, be lower than mortality, the group is extinguished (Caldwell, 1982).

THE DEMOGRAPHIC TRANSITION

The demographic transition began as a description of the modern history of Western populations in stylized form, but became elaborated into a theory, predominantly of the correlates of fertility decline. In the latter guise, it is an application of a theory of modernization, and thus a prediction of the demographic consequences of modernization for any society. In the rest of this essay, the question is pursued for societies currently classified as developing.

Modernization theory is at its strongest as a description of two polar equilibria. On the one hand, there is an agricultural economy with a strong kinship system and a weakly developed political State, at a low level of productivity, and with constricted spatial and temporal horizons; on the other hand, there is an urban industrial economy with a nuclear family and a well-developed nation-State, at a high level of productivity, and with broad horizons. It is only to be expected that a style of thought oriented to an integrated system would be at its best describing the compatibility of various structural features of a system in equilibrium; the many accounts are rich in their portrayals of interdependence (Cohen, 1967).

Modernization theory explains a process of temporal change in a particular society. But coexisting societies, each providing part of the environment for the other, may be at different stages in the process, and it is unlikely that the transition for either is unaffected by that circumstance. Those in the vanguard work out new solutions to new problems, increase their economic and political power, and have the opportunity to impose their will on the late-comers. Without further specification, it seems clear that at least two models are required, one appropriate to those societies in which modernization was invented, and the other appropriate to those on which modernization was to some extent imposed. The conceptual difficulty is that, until recently, almost all of the documented experience on which one could draw for the currently developing societies was that of societies which were in the vanguard of modernization.

The problem is more than that of the consequences of living in a world characterized by massive differences in economic and political power. The position is plausible that modernization was not a chance invention, but rather depended on peculiar characteristics of the vanguard societies. Consider the United Kingdom as the pioneer, apparently not a society showing gradual progress from a peasant form towards industrialism, but one that, as far back as worthwhile records go, was based on individual rather than corporate ownership (Macfarlane, 1978), with a system of fertility regulation keyed to nuptiality and a bilateral kinship system, with substantial emphasis on individual autonomy and a reasonably effective nation-State (Wrigley, 1978; Lesthaeghe, 1980).

Most accounts of modernization pay special attention to what happens to family relationships during the passage from one equilibrium context to the other. The transformation of the character of the family in the course of

economic development has been well delineated verbally. Economic development is achieved by specialization, by structural differentiation. Particular organizations, designed to do one thing well, compete successfully with the all-purpose kinship system. Activities once carried on inside the home are relocated outside. The family is replaced by specialized units of production and finance. It becomes stripped down to an organization itself specialized in the residuum of child-rearing, the sole activity for which some kind of family design (in the sense of a generational structure persisting over time) is probably indispensable. Adults acquire extra-familial roles which compete for their attention with parental roles. Child labour laws and compulsory education reduce the value of children as cheap manpower. Some of the family responsibilities for political and financial security are assumed by the State.

In explaining the transition from a traditional to a modern society, much effort has been expended on measuring particular facets of the two polar systems, and locating particular populations at one or another point along the continuum, e.g., with respect to urbanization or education, for the purpose of attempting to explain the movements of demographic indices. These empirical exercises typically adopt a multiple regression format. The customary outcome is clear congruence at the extremes, but little success in linking change in one or another demographic index over a particular time interval with change in one or another quantified socio-economic variable over the same interval. While there are immanent explanations for statistical failure, such as the cross-sectional character of most of the exercises, and the necessity for resort to crude and unreliable measures, perhaps there is a problem in principle: how can one devise a mechanistic test for a structural/functional theory?

A pervasive difficulty has been the general tendency to keep in separate compartments the demographic processes, on the one hand, and the social and economic processes, on the other. In consequence there is continuing confusion between theories that posit a sweep of social change, to which demographic variables respond, and those that treat demographic change as an external force to which the society responds. Much of the discussion of the urgency of achieving fertility decline as a condition for economic development falls in the latter category. Two polar positions have been characterized: population growth is an independent variable which determines economic growth; population growth is a dependent variable responding to change in material conditions (Gregory and Piché, 1982).

An important subset of research on the link between modernization and fertility decline, if only because of its sheer bulk, is what is known as differential fertility analysis. Aggregate considerations of the degree to which a society is modernized are translated to the individual level, so that one attempts to ascertain whether an individual is located in a traditional or in a modern situation. When a society undergoes a process of modernization, one facet of that change is the movement of individuals from less to more modern locations. On the premise that modernization promotes lower fertility, one expects that those in the more modern locations should show lower fertility. Probably the most important indices of modernization at the

individual level are those associated with modes of production (education, occupation and rural and urban residence) and their associated rewards. The rural life is symbiotic with a kin monopoly on the range of social activities; children form part of the family labour force. Urban contexts are associated with more expensive education and fewer employment opportunities for children. The role of the family is tapped by various attempts to determine the extent to which the individual interacts with unrelated others, but primarily by inference rather than by studying systems of interrelationship. To date, differential fertility analysis has, in the judgement of the author, contributed little to the study of the relationship between fertility and modernization because it is resolutely individual-oriented, and focused on variables that are primarily labels for black boxes within which the reasons for their predictive power remain hidden.

STYLES OF RESEARCH

In the foregoing, two contrasting styles of theorizing have been depicted. The micro-analytic model is oriented to individual behaviour. This style of research is often called elementaristic, because its characteristic approach is to look at the separate elements in a situation, and the relationships among the various dimensions. It is essentially a mechanistic view, in the tradition of Comte's positivism. (Comte's first name for sociology was social physics.) For the macro-analytic model, the theory corresponds more to an organismic view that the basic social reality consists of interrelated wholes which are at a higher level than the individual and his acts in the sense that the social structure must be explained in its own terms, and cannot be reduced to the actions of individuals (Martindale, 1965). The implicit assumption is that the appropriate research strategy is not to ask the individual about his or her motivations, in order to understand behaviour, but rather to determine the purposes of the group of which the individual is a member. Foremost among these is the maintenance of those institutionalized characteristics that constitute the group.

The brief sketch of modernization in the preceding section can be considered an organismic approach. Modernization is a structural/functional theory. It concerns the transformation of institutions, i.e., of those normative complexes that provide the "rules of the game" for the conduct of classes of activity. The central research question becomes the feasibility of observing those rules and changes in them.

The conditions for applicability of the micro-analytic orientation are differentiation, individualization and quantification (as with monetization). Monetized calculations are made feasible by the analytic separation of ends. The individual's acts can be measured with respect to functionally specific aspects or elements. This is a characteristic of a highly differentiated (modernized) society. Economics arose as a consequence of institutional change: the increasing tendency for atomistic units in an impersonal exchange system to acquire a livelihood through market sale (Frankenberg, 1967). The

process of secularization is associated with a progressive extension of the domain of economic rationality and the sphere of individual choice. The model places the individual ideologically at the centre of the universe. Survey research is a product of modern society, especially adapted to this style of thinking because individuals with the experience of life in a differentiated monetized market economy know how to respond to questions that call for answers abstracted from their conceptual environment.

In the macro-analytic (organismic) tradition, the unit of analysis is not the individual act but the normative instruction. Norms constitute the charters of groups. The criterion for membership is acceptance of their implications. Their violation elicits response from other members of the group. The argument and the explanation shifts to the group level because norms are group properties. Norms are standardized solutions to decision problems, directing individual behaviour away from what is perceived to be prejudicial to group interests (however attractive to the individual in the abstract) and towards what is perceived to contribute to group interests. The very notion of membership in a group implies receptivity to normative pressure, i.e., the willingness to incorporate group interests in individual decisions. One pays dues for the privileges of group membership. When individuals come together as a group, each surrenders certain rights and resources for collective use, in return for whatever the group has to offer (Namboodiri, 1980). The costs of deviations are sanctions administered in part by other members of the group, but also by oneself, to the extent that group interests have become internalized. When an individual confronts objective reality, the response is conditioned by the norms; they are in this sense part of that objective reality.

In a traditional society, relationships among individuals are multifaceted. One does not interact with another on a single dimension, but on all dimensions simultaneously. The interrelationship of aspects of the system provides a special kind of constraint, captured in terms like the "web of relationships", and the "cake of custom". Norms play their primary role in adjudicating among directions of action which have more than one outcome for more than one person. Every act in a traditional society is a socio-cultural act, embracing all aspects of the system of relationships among the parties concerned. Although an investigator may be able to perform the analytic task of abstraction of one facet of an act from the rest, it cannot be inferred that the parties involved are capable of so doing. The interpenetration of facets of each act is accompanied by acceptance of the cultural design in toto (Jones, 1982). Primitive economic systems lack impersonal relations. Labour is a social service with its reward calculated in terms of the total social situation rather than its immediate economic elements (Nash, 1968). The problems of understanding such a system have their analogue in biology: a common contention is that the development of biology has been impeded by attempts to extend to the complex and integrated biological systems the reductionism that has served physics so well. The systems are living: many requirements must be met minimally rather than one goal achieved maximally.

The conceptual conundrum at the heart of the problem of devising a theory of modernization derives from the extent to which the various facets of the modernization process represent transformations of socio-economic reality in the direction of amenability to treatment by means of a mechanistic model. They include monetization - the attachment of numerical values to goods and services as they pass through a marketplace; functional specificity and universalism - permitting one aspect of an object or a person's services to be considered independently of other aspects - and the growing tendency to regard the interests of the individual as a more significant test of the quality of a social system than any collective interest. Economics, and the model that epitomizes an economic style of thinking, has gradually been made feasible by modernization. McNicoll (1978) comments that "the structure of society that formerly held people in suspension receded, leaving individuals to struggle in a harsh neoclassical world".

If one takes the position that a mechanistic model is insufficient for the task of explaining a process of structural transformation, then the question must be confronted of the formidable problems involved in observing and identifying the norms that constitute the units of structural analysis. Having averred that actions depend in part on the presence of norms, either internalized in the actor or otherwise given effective force by the actor's recognition of those positive and negative sanctions available to interested others in response to the act, one must address the question of how to detect those norms. Hawthorn (1970) takes the position that, since norms exist only in the minds of individuals, we must get at them by asking people questions: only in that way can we infer that an activity is governed by a rule. Thus one observes the act, and achieves an understanding of it by evoking the actor's description of his mental state. While the argument seems unexceptionable, the problems of practical research following its guide are substantial.

Inference of the presence and character of a norm from an actor's explanation may be simply naive. If the individual is reporting the acts he or she has engaged in, that account is suspect because of the presence of norms: the tendency is either to deny an act that may be judged as improper, or to misreport its character and circumstances in such a way that it appears to have been proper. Similarly, the actor is likely to present a moral image, in providing a reason for any act, that is bent in the direction of the normatively acceptable. Quite aside from such misstatement, it is the very nature of norms that they are so woven into the fabric of life that the actor is unlikely to feel the need to mention those things that are understood because they are self-evident, and tend to omit reference to knowledge shared by everyone within his acquaintance (Bourdieu, 1976). Inference must hurdle a barrier of silences and elliptical statements. The actor may be literally unable to articulate a sense of the system of which he is a part. Norms are at their most effective as directors of individual behaviour when the individual cannot perceive the distinction between self interest and group interest.

If the actor is not asked what norms constitute conditions for his acts, because of the expectation of incoherence or bias in the response, it is still possible to observe what people do and what they refrain from doing, inferring from uniformities of behaviour the presence of norms that would make them explicable (Levy, 1952). Yet if norms are inferred rather than observed, they may permit a more compelling account of the situation but they are not really part of the analysis, unless one is prepared to reason circuitously. Where the evidence for an explanatory variable is the behaviour it is invoked to explain, the relationship is scientifically impotent because it is irrefutable.

Sociologists are convinced that there is a level of social reality, not directly observable, which affects the behaviour of the individual. In this sense, sociologists are normative determinists (Hawthorn, 1970). Rather than trusting individuals to perceive and report the norms that constitute their social selves or falling into the tautological trap of inferring norms from behaviour, the researcher would seem obliged to investigate the properties of the system of relationships in which the actor is a participant. If, as we believe, the principal source of fertility change over time and fertility differences among cultures is variations in the institutional context, then we must learn to study institutions as normative complexes. The first step in that task is recognition that the appropriate source of evidence is at the level of the group, not the individual.

The difficulty of establishing canons of verifiability in the identification of norms, as group properties, from other properties of groups, leads to a familiar outcome. Those variables in a situation requiring explanation that are amenable to measurement by straightforward procedures seem for that reason to be more real than those for which the conceptualization and methodology are primitive; cultural variables tend in the circumstances to be either ignored or treated as illusion or rationalization. Like other empiricist disciplines, demography has the characteristic of permitting the feasibility and availability of data to dominate the process of conceptualization. We suffer from a tyranny of the quantifiable.

The preceding account is not at all intended to lead to the conclusion that a choice must be made between one or the other style of research (so that the issue is which one). Nor would it be satisfactory to conclude that one approach serves best in the traditional context and the other in the modern context, since such an outcome would defeat the purpose of studying the continuum of transformation from one into the other. Neither approach is sufficient in either context. In a traditional society, it may be broadly true as a first approximation that individuals follow the forms set for them by the society in which they live, but their actions are nevertheless influenced also by their appreciation of their personal interests (Wrigley, 1978). Likewise in a modern society analysis would be impoverished were mechanistic arguments to remain uncomplemented by the consideration of structure: of agreements and rules (Arthur, 1982). The present writer is far from being able to present a coherent statement of a strategy for resolving the dilemma, beyond the strong conviction that it will be found much less

productive to try to enrich micro-analytic models by providing normative footnotes than to begin with a structural framework, in which the processes of individual decision-making are embedded.

MORTALITY DECLINE AND FAMILY STRUCTURE

In the rest of this account, some aspects of modernization are considered with direct implications for family structure (and particularly for intergenerational relations) and thus for fertility. This section investigates some consequences of mortality decline for family structure, treating mortality decline as an initial dimension of the modernization process, exogenous to family structure and behaviour. In the following sections, the effects are examined of the creation of various specialized institutions competitive with the family in performance of its traditional functions, first with respect to the adaptability to external change within the constraints of traditional family morality, and then with respect to change in the norms themselves in response to growing strains on role relationships in the family system. The final section contains a sketch of some policy directions suggested by the line of analysis.

The focus of the account is what is called here the intergenerational contract (Ryder, 1976). This contract specifies the flows of goods and services, broadly conceived, between the senior and junior generations in a family, over the course of their respective overlapping individual life cycles. Throughout the life cycle, the individual who survives moves through phases of being a net consumer, then a net producer, and finally a net consumer again - with interspersed episodes of dependency associated with illness and unemployment, for example. The family design can be considered as a solution to this problem of the consequences for the individual of the passage of time. The intergenerational contract serves the purpose of achieving resource transfers from those who are net producers to those who are net consumers. As a first approximation to its justification, a norm of equality prevails, so that those who have more help those who need more, together with a norm of generational reciprocity, necessarily asymmetrical because of the ever-changing personnel over time (Hill, 1970).

The intergenerational contract has several idiosyncratic aspects. In the first place, the newborn are parties to a contract the terms of which they are unable to bargain about. The contract is drawn up by the senior generation, on the basis of legitimate expectations, but the fulfilment of the contract by the junior generation is conditional on the success of efforts at socialization and social control of them by the senior generation. In the second place, each individual's lifetime is encompassed by two such contracts, one with the senior generation in his family of orientation and the other with the junior generation in his family of procreation. Long-term justice from the standpoint of the individual is achieved by writing the contract he initiates in the same terms as the contract written for him by his father, provided of course that there is the same relationship between expectation and fulfilment in the two cases.

Consider a highly simplified model based on the following assumptions: the individual is a net consumer up to age 15 and beyond age 60, and a net producer in the intervening years; the length of generation is 30 years. Any particular nuclear family incurs a debt during its earlier durations when the junior generation are predominantly net consumers; it acquires the resources to pay off the debt during its later durations when the junior generation has advanced into its net producer phase. The earlier durations for the nuclear family are also the time of movement of the parents of the senior generation into dependency. The obligation to provide a flow of resources in their direction may be considered as equivalent to payments for the property they transfer at their death.

In a subsistence economy, the flow of resources from net producers to net consumers must balance period by period. Since any particular nuclear family has a debit phase preceding its credit phase, the implication is that a flow of resources is required from older families to younger families. This is a primary purpose of membership in a descent group. Note that the argument is not appreciably changed if the family has a vertical extended rather than nuclear form. The pattern may be described as one of older families lending to younger families in the same sense that parents within each family lend to their children. The complement of the direction of resource flow is the age-hierarchized authority structure. Note, however, that there is an asymmetrical quality to the lending pattern: the debt is repaid not to the source of the loan (the preceding half-generation) but by lending in due course to the next half-generation.

If this is a plausible model, what can be said about the direction of net resource flow between the generations? From a familial standpoint, the direction is from earlier older families to later younger families. Within each family, on the other hand, consider the stage of the family life cycle in which both the senior and the junior generation are in the net producer ages. Cross-sectionally, the direction of net resource flow is from the junior to the senior generation. It would seem unreasonable to describe this as an exploitation based on seniority, since the family of whom the senior generation are the agents needs help in repaying an obligation incurred when the junior generation were dependents.

This asymmetrical intergenerational equilibrium is disturbed by mortality decline. For families in the earlier marital durations, mortality decline means a higher ratio of net consumers to net producers than formerly, and thus the incurring of a larger debt. But mortality decline also means that there are more families in the earlier than in the later marital durations than formerly, and thus a smaller source of borrowing. This is a familial version of the well-known proposition that an increase in the growth rate produces a younger age distribution. One structural implication may be a weakening of kinship bonds.

Now consider the consequences of mortality decline for the net balance of consumer and producer person-years during the course of the life cycle of a particular family. If one takes the view that children in the second 15 years

of life contribute to the family their net product in repayment of the family debt incurred when they were in their first 15 years of life, mortality decline has the consequence of increasing the person-years of the junior generation in the net producer ages relative to their person-years in the net consumer ages (since the slope of the survival curve varies inversely with the level of mortality). Moreover, the increase in parental survival defers the time when control of the family property is passed to the junior generation. This may increase the length of the period during which the junior generation contributes to the needs of its family of orientation.

With the proviso that the traditional intergenerational contract remains in force, specifically that the junior generation contributes to the needs of its family of orientation during its initial producer ages, the effect of mortality decline from the viewpoint of the senior generation is to make each child a better investment, and thus to imply no motivation to reduce fertility. From the standpoint of the junior generation, the situation looks very different. In preface, note that there is equilibrium in a dual sense when mortality is high and fertility is at the replacement level. The net reproduction rate of unity can be thought of as ensuring, on the average, that each role in the preceding generation will be filled in turn by a member of the succeeding generation. The less obvious kind of equilibrium is temporal: the age of the father at death is in close correspondence with the age of the son at marriage (Wrigley, 1978). Both kinds of equilibrium are disturbed by a decline in mortality unaccompanied by a decline in fertility: the numerical representation of the generations, and the timetable of overlapping life cycles. To get a sense of the numerical magnitudes involved, the author exploited a model presented elsewhere (Ryder, 1975(ii)). A comparison was made between an equilibrium situation in which high mortality was matched by replacement fertility, and a disequilibrium situation with the same fertility but substantially lower mortality. In the equilibrium situation, there would be 1.2 surviving sons of average age 23 at the father's death; in the disequilibrium situation there would be 2.5 surviving sons of average age 33 at the father's death. The strain on the system of respective rights and responsibilities from these two changes is evident.

The obligations of sons to father can be generously met, because there are more of them, and the father's control through ownership of the family property lasts longer. On the other hand, the ability of the father to meet his obligations to his sons is sharply attenuated (barring a substantial improvement in resources). The essential reason there is no stimulus for the father to reduce fertility in anticipation of such a situation is the assumption that the costs can be shifted to the sons. If the inheritance takes the form of land, there is either subdivision so that each son starts out with less than his father did, or some of the junior generation is disinherited. Moreover, the delay of the time of the inheritance means that the transfer does not occur until after the junior generation has accumulated a substantial debt position in their families of procreation.

Although the size of the family of procreation of the senior generation is enlarged by mortality decline, its dimensions from the standpoint of relationship between person-years of net consumers and net producers are

little affected so long as the intergenerational contract remains intact. The principal manifestation of population growth in any event is not the size of a family so much as the number of families. Moreover, the increase in the number of families is disproportionately of those in their earlier debtor phase relative to those in their later more productive phase. The focus of the strain on family structure caused by mortality decline is the inability of the father to provide the same beginning for the families of procreation of his sons as he was provided, and therefore the tenuousness of his hold on his sons and on their product as young adults.

Two directions of demographic response by the junior generation are plausible. On the one hand, there may be migration. Fulfilment of the traditional intergenerational contract is prejudiced not only by the inability of the senior generation to justify their authority by fulfilling their part of the bargain, but also by the attenuation of bonds as a function of distance. On the other hand, there may be delay of marriage. This is a further cost imposed on the junior generation, and has the significant corollary of coinciding with a life cycle stage when the productivity and power of the junior generation is increasing and that of the senior generation is decreasing.

In summary, mortality decline sets the stage for generational confrontation. By way of footnote to this section, it would be highly worthwhile to develop models of family structure, employing alternative assumptions about mortality decline, production and consumption as functions of age, and particularly alternative forms of intergenerational contract to replace the sketchy suggestions of this account. Some interesting work of this kind is now being pursued by Willis (1982).

INSTITUTIONAL COMPETITION

Because the author believes that the assumptions about family relationships conveyed by the sense of the intergenerational contract are the primary determinants of fertility, this account of modernization is focused not so much on fertility itself as on those assumptions, i.e., on the system of family morality. As institutions competitive with the family arise, and economic and political markets become more effective, the traditional system is capable for the time being of adaptation without modification of its premises. Nevertheless, the points of structural strain within the traditional family experience progressive pressure, the alternatives outside the family become more attractive to those members who are feeling increasingly disadvantaged, and the system begins to break down.

The new opportunities provided by the presence of a labour market may for a time be exploited by the family within the framework of the traditional family morality, as a more efficient way to produce part of the needs of the family. The key question is whether the father can claim the wages for the son's labour for family purposes. There are various alternative situations.

In the first place, the father may be the employer. When the family farm creates produce for sale, the patriarch is the owner and employer, and the income from this activity is under his control. If the son works for a wage, part time or full time, for a non-family employer, the stage is set for a struggle between son and father for control of the son's income. The son may work for wages with an outside employer but continue to live at home. In this case the income at least passes through the son's hands, and he may be reluctant to relinquish all of it to be disposed of by the father in the interests of the family (as the father perceives those interests), but the son is in a weak position because he remains a recipient of domestic services. Income helps to determine the relative resources over which each family member has some immediate control, and thus the relative power of family members. Finally, the son may work for wages with a non-family employer and also live in another household. In this case the question would be the extent to which familial obligations still carry some weight, and the extent to which the son continues to regard the family as a potential source of future help in an emergency situation.

What is the strength of the claim that the father has on the income of the son? In the first place, there is the son's stake in the inheritance. The patriarch is the steward of the land, the ancestral family property. The question may be particularly acute if there are brothers. Brothers are socialized to rivalry with each other rather than with their father. Sons will be less likely to rebel if there are rivals for the inheritance. In the second place, the threat of disinheritance may be reinforced by the threat of ostracism. The question in this case concerns the availability of alternative opportunities for the son, i.e., whether the son has continuing need for the family connection. In a society dominated by kinship considerations, the individual without family support may be hard placed to locate an economic niche. In the third place, the agreement to hand over control of one's income to the head of the family is a congenial custom because of the quid pro quo when the son becomes head. The son expects his children to treat him the way he treats his father (Caldwell, 1982). Underlying all these considerations of personal interest is the effectiveness with which the son has been socialized to regard parental control over income as right and proper, and obedience as the mark of a good son.

One justification for the form of the intergenerational contract is that the older generation owns the sources of production: land, knowledge, skills and contacts. The contribution of labour by the junior generation until the father's death is a way of buying that property. The basis of respect for authority is that the older generation has what the younger generation needs; it is undermined when the younger generation is exposed to alternatives which are more attractive or less demanding. Although the father initiating the contract may want to make it equitable in relation to the contract visited upon him by his father, times change, and the social support for the earlier kind of relationship may have evaporated. Moreover, the enforceability of the contract depends on the options available to the junior generation, and it is likely to be broadening substantially over time.

The reproductive strategy, and the risk associated with that strategy, depend on the economic level of the family. For the poor, economic survival is the issue, and the emphasis is necessarily on the minimization of losses from day to day. Poverty forces households to disinvest in their future and thus in the future of the children. Children are insurance against various kinds of misadventure. With high risk, and ineffective alternative institutions for assistance in coping with risk, the insurance value of children may be an overriding incentive for unrestrained fertility (Cain, 1982). Those denied access to the rewards of the modern sector are forced to view the family as a survival mechanism in which children are essential assets (Ratcliffe, 1978). Family relationships may represent the only source of help in periods of ill health or unemployment; the family with no or few children is perceived to be vulnerable. Only with the development of alternative institutions of employment and social security, and the growth of confidence in them, will the poor exchange the fertility strategy for alternative options (Schnaiberg and Reed, 1974). Nevertheless, the risk of that strategy for the poor is evident: sons in the lower social strata have little to lose if they choose to rebel against their elders.

If, on the other hand, there is sufficient productive surplus in the family to permit the option, the father may attempt to increase the returns from members of the junior generation by investing in their education. The capital market for formation of human capital in the child is the family. The strategy implies not only larger expenditures but also maintenance of the child in a non-producer status for a longer time. Children are worthwhile investments from the parental standpoint if they remain responsive to the contractual obligation to contribute at least part of their income, once they begin working, to the parents. The likelihood of that depends in part on the extent to which the fathers are viewed as having a substantial role in making the new opportunities available. The evident risk is that the one-sided contract may be abrogated by mobility and individualism.

In the process of modernization, there is increased demand in the labour market for educated workers. Since the educated are rewarded more than the uneducated, it is tempting for parents to educate their children in order to tap this new resource for the benefits of the family. Yet it is more likely that the pressure for education of the younger generation comes from outside rather than from inside the family. From a societal viewpoint, education provides an upward ladder for the gifted, and a key to national economic growth; it has a redistributive function to further social justice, and it provides an electorate with education in responsible choice. Schools make citizens out of family members, teaching individuals how to act for the good of society. Moreover, if the young are kept out of the labour market - either from considerations of humanity or because they are perceived to be competing with their elders for wages - the social problem of idle youth must be coped with. In every society, those in the gap between childhood and adulthood pose special problems (Gulliver, 1968). The school provides a reasonably effective agency of social control (Smelser and Halpern, 1978).

The literature on the relationship between education and fertility is extensive and rich. Education broadens horizons spatially and lengthens them temporally; it reduces uncertainty, and brings a larger array of costs and benefits into the personal calculus; it provides one with the possibility of enjoying a wider range of pleasures, in particular causing non-familial goods to be evaluated more highly. For the prospective parents, this increases the attractiveness of non-parental relative to parental pursuits, or, otherwise said, raises the opportunity cost of childbearing. Parenthetically, too little attention is paid, in the statistical analyses of the relationship between fertility and education, to its distinctive significance for the two generations involved. Most analyses stress that education makes the individual receiving it a different person with respect to his or her reproductive decisions, but omit from the account the implications for fertility of the parent who pays for that education.

Education of the junior generation is a subversive influence within the family. Boys who go to school distinguish between what they learn there and what their father can teach them. The structure of control in the traditional family is legitimized in part by the fact that the father possesses the knowledge the son needs for his future. The reinforcement of the control structure is undermined when the young are trained outside the family for specialized roles in which the father has no competence (Levy, 1966). The young become spoiled in the sense that they do not want to do unskilled work, and their parents are apprehensive about asking them to do it. Education makes children superior to parents: they have greater access than their parents to the new key to social status. Social change differentiates generational milieux. History pulls parents and children apart.

Discussion of employment opportunities for the junior generation outside the home casts the argument in terms of a struggle between the father and the son. But there is another struggle going on, that between the family and the State for the allegiance of the individual. The society has interests in the rational allocation of human resources to serve aggregate economic and political ends, and expresses those interests by substituting individualistic for familial principles in role assignment. Political organizations, like economic organizations, demand loyalty and attempt to neutralize family particularism (Kanter, 1978). There is a struggle between the family and the State for the minds of the young. Parents who may want their children to work are forced to send them to school and they are prevented from neglecting and abusing their children. The school is the chief instrument for teaching citizenship, in direct appeal to the children over the heads of their parents. The school serves as the medium for communicating state morality, state legal tradition, and national cultural and historical myths. The attainment of universal schooling, according to Caldwell (1982), is the principal force for change in intergenerational attitudes. Compulsory education itself is tantamount to a rewriting by the State of crucial elements of the intergenerational contract.

In a discussion of the competition among institutional forms for commitment by the individual, a general theme is the distinction between association based on the principle of descent, and association based on the

principle of residence. In the broadest terms, the descent principle is responsive to the problems of time - ensuring the continuity of the socio-cultural design for survival from generation to generation - whereas the residence principle is responsive to the problems of space - ensuring optimal adaptation to the environment. The strength of the descent system is preservation of structure over time, through control of collective property, through warfare and through performance of collective ritual. To a member of a primitive family, its property is the source of livelihood, its elders the high government, its ancestors its gods, and its young men the defense and the source of support in old age. The individual becomes a member of the descent group by virtue of birth, is socialized to accept obligations to that group, and receives from it the resources needed for individual survival.

As societies evolve, a new definition of social membership becomes ever more prominent, informed by the advantages of contiguity. The descent group declines in importance when membership no longer provides rights in the means of production, when the function of defence is served by a centralized political system, and when mobility impairs the relational system (Goody, 1968). Political development is associated with the development of the residential community. Community is the generic designation for groups organized on a predominantly localized basis. Community organization provides individuals with opportunities for social intercourse, more abundant subsistence through co-operation in productive activities, and insurance against temporary adversity through mutual aid and protection through numbers. The community, as a network of face-to-face relations, is the primary seat of social control. The ultimate inducement to social conformity is the threat of ostracism from the community. The residence principle is continually open to empirical verification, receptive to innovation and the allocation of resources on economic principles. Immediate survival on a day-to-day basis is achieved by coping with the environment through joint utilization of resources in response to the array of opportunities and threats from the shared environment. The descent principle, to the contrary, admits of no test of efficacy other than the outcome of total confrontation with other groups similarly constituted.

One of the most frequently encountered antinomies in accounts of social change is that between the traditional and the rational, but that labeling misplaces the key distinction. The focus of the traditional society is no less rational, but the rationality is directed towards the overarching purpose of preservation of the group constitution. The reaction to an opportunity for adaptation is customarily negative because priority is given to concern for the implications of novelty for organizational persistence. In the so-called rational society, to the contrary, primacy is given to individual ends, and material advantage takes precedence over risks to the prevailing institutional structure.

In the subsequent evolution of socio-cultural aggregations, the heirs of the residence principle have been the community and the State, both territorially organized and responsive to the requirement of organic solidarity (in Durkheim's terminology), whereas the heirs of the descent

principle have been the ethnic group and the nation, putatively eternal and responsive to the requirements of mechanical solidarity. The kinship system survives in a different guise.

IDEOLOGICAL COMPETITION

An important source of strain on the traditional intergenerational contract, at another level, is the presence of an alternative family model, associated with the material success and economic and political power of the West. Less developed societies have been invaded not only economically and politically, but also ideologically. People in the developing countries want to learn the Western secret of power, and perceive it to lie in education, and in the Western type of family (Caldwell, 1982). The overwhelming strength of the West makes this an exportable commodity as well. The West provides a model for social as well as economic change, presenting an alternative view of the family in which the individual is the focus of attention and concern. Some part of the attractiveness of the Western family model may be logical - a sense that one key to the increase in productivity is an individualistic orientation - but some part of it may be magical.

The thesis that the Western model of the family is imported into developing countries, and plays a supportive if not determinative role in social change, has a convincing ring to it. But granting the premise that normative constructions may be disseminated, it is not clear whether the structure in toto is imported (cf. Freedman, 1982) nor exactly which form of the Western model has the most attraction. The predominant ideal for the Western family may still be the bread-winner model. The family of procreation is completely independent of the family of orientation, but there is a sharp division of labour by gender and an authoritarian allocation of power within the family. To the outside world, the husband/father is responsible for the care of his wife and children, and he is ideally the only one to participate in the labour market (a position supported by systematic discrimination in his favour in that market). Yet there is now evolving a much different form of family, particularly one that is egalitarian with respect to the division of labour by gender, and it would be premature to characterize any terminal equilibrium position. (One of the unfortunate consequences of adoption of terms like "developing" and "developed" societies is the implication that the former are in the process of changing whereas the latter have stopped.)

Caldwell (1982) has used the term "emotional nucleation" to characterize the principal familial change attributable to Westernization. The term points to a change of balance within the nuclear family with respect to which ends have priority. Conjugal relationships take precedence over consanguineous relationships; the influence of the wife increases relative to that of the husband; the interests of the children increase in allocation decisions relative to those of the parents; authority is tempered by egalitarianism. The increase in sentiment is not unassociated with another dimension to the Western invasion: the allure of household consumption goods. If sentiment is

to be allowed to play a more important role within the family, it must be affordable. In a poor society, the individual end of delight in sentimental relationships must take second place to self-abnegation and personal sacrifice in the face of necessity. Sentiment is a pair bonding that can prove prejudicial to other responsibilities in other relationships. The increase in emotionality between the generations may reduce respect for authority because it implies a non-hierarchical relationship.

The increase in sentiment within the family is an accompaniment of the specialization of family functions. As the family is stripped of its responsibilities for education, employment, protection, credit and social security, it becomes progressively more specialized in non-marketable services, in particular the development and maintenance of the individual self, and the exchange of affection and emotional support among its members. The test of the effectiveness of the family comes to be how it serves its members as individuals, rather than how its members serve the family group.

Stone (1977), writing of the early modern United Kingdom, characterized the new kind of family by the term "affective individualism". The market economy is important to the growth of individualism, and the development of the concepts of individual liberties and property rights. One requisite for the growing sense of individual autonomy is independence of the individual's family of procreation from his family of orientation. Yet it may not be quite correct to identify the distinction between the traditional and the modern family as one of growth of individual freedom. Rather, there is a shift of allegiance of the individual from the family to the society. After all, the patriarch may be the archetypical tyrant, but there are many societies in which the interests of the collectivity take precedence over the interests of the individual.

The traditional morality of the family is threatened by any institution that competes for the hearts and minds of family members by offering services in exchange for commitment. Although some religions, like Hinduism, are family-centered, or, like Islam, are directed primarily to heads of households, others, like Buddhism, Judaism and Christianity, address their moral messages to the individual and are in that sense subversive of traditional family morality (Caldwell, 1982). The emphasis is sufficiently pronounced in Protestantism that it is generally credited with a crucial causal role in the beginning of the process of modernization.

Previously we drew a contrast between two models of the social system: the elementarist model which focused on individuals as decision-makers, and the organicist model which focused on the normative structure. A comparable distinction can be made in considering how to study social change. There are two ways to explain the solidarity of a family structure, distinguished by their relative emphasis on the twin processes that provide that structure: socialization and social control. Where socialization is emphasized, the occupants of different positions internalize the group design and come to regard it as good and just and proper. Satisfaction is derived from fulfilment of responsibilities in those terms. The good of the individual

member is subordinate to, and in the long run best served by, attention to the ends of the collectivity, in particular the survival of the group (persistence of the group design).

In such a model, the nature of the contracts binding individual members is not subject to the test of satisfaction achieved by individual members, and is accordingly not questioned should a change in external conditions produce unfavourable outcomes for some of the group. If a theory of social change is to be developed from this base, it may take the form of some immanent process of progressive differentiation and reintegration, as with vanguard societies, or the test of survival in competition with other societies which follow different precepts. The Caldwell (1982) view of Westernization as a corrosive influence on traditional family morality falls into the latter category. Yet the key role he assigns to the patriarch as decision-maker leaves him open to the charge that his theory of social change is less than institutional in spirit; it can be read as implying that social change is at root a consequence of change in the individual decision-maker (Thadani, 1978). The model of solidarity through consensus, achieved by effective socialization, has proven useful in the study of simple societies in which almost all functions are familial, but it becomes progressively more difficult to adapt to a context of institutional competition, in which individuals are members of many groups and have many alternative directions of possible commitment.

The alternative model for explanation of the solidarity of a social structure focuses on the process of social control. From this viewpoint, the group is a set of members whose actions have consequences for one another. All members of the group have some degree of control over sanctions, rewards and punishments, which can be used to increase the probability that the behaviour of any other member is favourable to their interests. The individual is conceptualized as oriented to self interest, and thus potentially rebellious in the sense that membership in the group is regarded as conditional on the rewards the individual receives as a consequence of that membership, relative to the costs of membership to the individual, in comparison with a like cost/benefit analysis for affiliation with alternative groups. The key to order in such a system is the differential control of rewards and punishments by those who are senior in the group hierarchy, in short by power. Socialization in such a model plays the subsidiary role of supporting the prevalent power structure by instilling in the young and inexperienced the myth that their own interests are best served by furthering the interests of the group (and its leaders).

From this perspective, the group is continually being tested for its ability to yield satisfactions to its senior members, with control maintained through sanctions imposed on its junior members, and in competition with alternative membership groups. Modernization is a process of development of alternatives which permit contracts in extra-familial markets which are more advantageous to individual interests than those within the family. The family is sensitive to changing conditions because they may affect the perceived costs and benefits of continued allegiance to the family and therefore influence the choice of commitments by the individuals whose interests are at the centre of the analysis.

In our judgement, it would be a strategic error to give undue emphasis in research design to either the model of solidarity based on socialization or the model based on social control. The key distinction between them is the criterion of effectiveness: for the former the interests of the group, for the latter the interests of the individual. Yet a point made previously deserves to be repeated. The process of social change should not be misread as a progressive augmentation of the interests of the individual relative to those of the group, because the structural transformations associated with modernization are more accurately characterized as the transfer of individual allegiance from one kind of group to another. From the standpoint of the study of fertility, the key significance of this transfer is not the direct and unequivocal interest the family has and can enforce in regulating the forces that may change its dimensions, but the indirect and equivocal interests of the more remote collectivities with which the individual becomes progressively more closely affiliated during the process of modernization.

EXTERNALITIES

Any consideration of policy is concerned with actions by Governments with the intent of making the future more attractive or less unattractive to those whose interests the Government serves than would be expected in the absence of such actions. For present purposes, the broad assumption is made that the aim of the Government is to increase the pace of economic development. It is also taken as given that the pace of economic development is negatively affected by the rate of population growth. The basis for that position, in brief, is as follows. The key to economic development is rising productivity. That is achieved by an increase in the ratio of (human and physical) capital to labour. In the short term population growth decreases the supply of capital by diverting resources into increasing consumption which might otherwise be invested. In the medium term, population increases the supply of labour as population growth advances into the labour force ages. In the long term, population growth reduces the yield from additional increments of capital, as a reflection of ultimately diminishing returns to scale. Finally, of the logical alternatives for reducing the rate of population growth, fertility reduction is the least unattractive.

If the argument at the aggregate level applied with equal force at the individual level, the level at which decisions are made about fertility, one could rely on rationality to reduce fertility. In short, there would be no need for a national population policy. The justification for a government programme arises from a discrepancy between the costs and benefits at the micro-analytic level and the costs and benefits at the macro-analytic level. This is the problem of what economists call negative externalities: the individual decision-maker is able to displace some of his or her costs onto others (Birdsall, 1982). High fertility is costly to a poor society, but not to the families responsible, relative to the perceived costs of fertility regulation.

One application of the externality concept is the argument (McNicoll, 1975) that population growth occurs at the village level, but the problem of employment of the increased number of entrants into the labour force is not solved at that level. Rather the surplus migrates to the city; in this way the village displaces its population costs to the city. The policy prompted by this line of argument would be a restriction on migration from the village to the city, in effect confining the problem to the location where it can be solved. On the other hand, restrictions on individual mobility would be politically unacceptable for many populations, and might be counter-productive to the process of spatial redistribution of labour required in the process of modernization.

The concept of externalities is directly applicable to the form of the intergenerational contract. If the senior generation, in making decisions about fertility, perceives that the benefits exceed the costs, from their standpoint, because of an intergenerational contract that obliges the junior generation to contribute to family income when they are young adults, this is tantamount to a displacement of costs from the senior to the junior generation. The negative externalities associated with fertility, from the standpoint of the society - and thus provoking the need for a population policy - are experienced by the junior generation, viewed from the standpoint of the family. Just as the costs of population growth are displaced from the village to the city, so are they displaced from the senior to the junior generation. From an aggregate standpoint, economic development means that the level of per capita income is higher at a later than at an earlier time. In terms of the sequence of generations which constitute the population as a function of time, economic development means a higher level of income for junior than for senior generations. The familial counterpart of societal development is investment made by the parents with returns accruing to children, in short a net flow of resources from parents to children and thus a new intergenerational contract.

The general policy orientation that is derived from the foregoing account is to spur the process of modernization by accelerating the shift of individual allegiance from the family to the society and systematically discriminating by age, through various kinds of resource transfer, in favour of the new cohorts. The most direct approach is education. Economic development at its simplest is measured by an increase in the income of sons relative to that of fathers. Education is one of the means by which this is achieved.

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B. Familial roles and fertility

Christine Oppong*

INTRODUCTION

This chapter presents a conceptual model indicating some of the established and hypothesized links between a number of labour laws and policies, in particular International Labour Organisation (ILO) conventions, divisions of labour and resources by sex and age, familial roles and fertility (figure I).^{1/} The labour laws and policies considered include legal protection of the young through adoption and execution of conventions regarding the minimum age for employment and thus the suppression of child labour; protection for the elderly and incapacitated through employment-related social security systems; support for sexual equality, maternity protection legislation and assistance for workers with family responsibilities and programmes, and laws to increase individual access to training, employment and income-generating opportunities in non-familial contexts.

Such legislation and associated employment policies, programmes and institutions are noted to have manifold potential impacts upon familial roles and relationships which are seen as the crucial intervening links between economic institutions, employment policies and laws and programmes, on the one hand, and fertility-related activities and expectations, on the other. This is an old theme familiar from early writings on the demographic transition and one which constantly reappears. By the end of the past decade it was also taken as a matter of course by many that improvement of women's legal rights, resources and opportunities above all, opportunities for education, training and remunerative employment outside the home - were important factors affecting fertility levels and family planning.^{2/}

In view of the diversity and sometimes contradictory nature of findings, however, and the continuing lack of understanding as to why correlations and changes occur, considerable perplexity has been expressed regarding the precise mechanisms and processes of fertility change in contrasting environments, and considerable resources have been allocated for the decade of the 1980s to help explicate the connections between the variables. Two points are repeatedly emphasized in these change processes. They are that the divisions of labour, resources and power between females and males, the young and the old and the contrasting family systems of different communities and cultures must be taken into account.

*International Labour Organisation (ILO).

Here are briefly outlined the content and goals of some of the ILO conventions and programmes that have a bearing on the conditions widely thought to be related to fertility decline. These include improved status of relatively deprived groups, such as women, children and the aged, and individual access to training, employment and incomes. These changes are viewed in terms of their potential impact on family relations, including changing parental roles and the impacts of diminishing child labour on the benefits and costs of bearing and raising children and the increasing availability of social security benefits. Comparative empirical evidence is mentioned. Another aspect is sexual equality, in particular the impact of equality in the occupational sphere on equality in the domestic domain and the consequent effects on reproduction. A variety of evidence from different countries is mentioned. In addition, the impacts of social and spatial mobility on kin roles are indicated and the potential impacts on role conflicts, individualism and lower fertility. The concluding summary notes some of the implications of the discussion for future work, in particular the documentation of domestic change processes in contrasting cultural contexts.

STATUS OF THE YOUNG AND OLD:
CHANGING PARENTAL ROLES

As has been pointed out on many occasions, child labour is a field in which the concerns of enlightened labour policy and population policy converge and mutually reinforce each other. But a prerequisite for the reduction of child labour is that education or training facilities should be made available to all children below the minimum age of employment and that compulsory education provisions should be enforced.^{3/} Productive work by children aged 5 to 15, however, remains a common feature of many societies, especially in low income and rural areas. It often remains undocumented so that the full extent of it is not known. A breakdown of the estimate of child labourers gives one million in developed countries, 29 million in South Asia, 10 million in Africa, 9 million in East Asia and 3 million in Latin America. Of all these, 80 per cent would be classified as unpaid family workers. The majority are estimated to be in agriculture or in small-scale industries in rural areas and in workshops or quasi-family undertakings in urban areas, and there is a growing body of evidence, including global statistics and ethnographic case studies, demonstrating the extent to which parents in different cultures and time periods rely upon the labour of their own and other people's children (Mendelievitch, 1979; Rodgers and Standing, 1981). Time budget studies have begun to quantify graphically the extent to which child labour provides a critical substitute for adult time, enabling parents, kin and others to undertake alternative activities or to enjoy leisure and thus affecting perceptions of their value (e.g., Khuda, 1977, 1980; Ho, 1979; Burikpadi, 1977). Increasing attention is now being given to the factors affecting the economic activities of children and leading to a reversal of flows of time and material goods to children from parents, instead of this traditional pattern of benefits enjoyed by the older generation.

Two sets of factors have been identified as being among the structural influences on the extent and nature of the economic roles of children in low-income countries. These are the mode of production and the associated structure of the labour market (see Thadani, 1980). In societies based upon pastoralism, hunting and gathering almost everyone capable of contributing to subsistence activities does so, including children. Similarly, in subsistence agricultural communities, children play an important part. A long-run decline in child employment has been associated in the industrialized countries with the growth of wage labour and capitalist relations of production, although in some cases the use of cheap child labour has assisted the process of capital accumulation. As was noted above, in many cases women would have to discontinue their farming and trading activities and would consequently cease generating income by traditional methods, if they did not have this highly prized assistance from children (e.g., Schildkrout, 1981).

The International Year of the Child, 1979, was a time for taking stock in the ILO of the activities and achievements on behalf of children and for taking a new look at problems which concern them in the occupational sphere, especially child labour. Two volumes of studies in particular have spelled out many of the relevant issues (Mendelievitch, 1979; Rodgers and Standing 1981).

The prohibition of child labour has been, and remains, one of the central concerns of the ILO. At the same time, as well as promoting prohibition of child labour the International Labour Conference has consistently sought to protect working children from undesirable conditions of work. Thus a series of conventions and recommendations prohibiting certain types of work and regulating conditions of work of young persons also apply to children, including prohibitions on night work and hazardous and dangerous work. ILO instruments also provide for stricter standards regarding hours, rest, holidays, apprenticeships etc. In addition to standard-setting activities, a considerable amount of research has also been done, findings circulated and meetings and seminars organized. Another aspect of this work has related to vocational guidance and training.

As a result of global standard-setting activities there remain only a few countries that do not have legislation concerning minimum age or regulations on the employment of children covering industry, and in the organized sector at least, considerable progress has been made. National legislation on the subject of child labour is based to a large extent on the many relevant instruments adopted by the ILO since 1919. At the same time there is recognition that laws and inspection of workplaces are not enough and that the strategy to eliminate child labour should include attacks on poverty and underdevelopment such as are included in strategies and programmes to improve access to employment opportunities and modes of income generation.

Just as children may be critical to the economic status of their mothers and fathers through the labour power they supply to them for their current income-generating enterprises, so they are in many cases critical for their

future economic status in old age, in societies in which the old have no hope of social security benefits from their occupations and no promise of security from kin or affines, and in which residence with an adult child is the normal mode in post-productive years (e.g., Kagitçibasi, 1982). The 1974 World Population Conference at Bucharest emphasized the importance of the establishment, implementation and expansion of state-sponsored old age insurance, on the grounds that children's support of elderly parents encourages large family size. By that date there had in fact been indications that pension programmes might be related to the lowering of fertility.

Some results have been reported by Hohm (1975). Friedlander and Silver (1967) and Kelly et al. (1976). Recently Entwisle (1983) has sought to provide more convincing empirical evidence.

Extension of social security benefits including old-age pensions in countries of the developing world to farmers, fishermen and rural workers in general and to the self-employed as well as to urban employees are an important area for ILO legislation, technical assistance and recommendations, and they feature in ILO-sponsored documentation and dissemination of information and advice.

The social security measures designed to provide protection against the potential ill effects of old age, disability and death of the main family income-earner have been widely recognized as having potential impacts on fertility-related policies and practices. Thus, not only has the ILO been committed since its early beginnings to the promotion of social security as a social development measure for workers in both urban and rural areas but its link with population issues has been recognized. In addition to the adoption of a number of significant international instruments in this field and the study of problems of introduction of social security in different and vulnerable sectors of populations as well as assistance to developing countries attempting to adopt such measures, the ILO has also undertaken research and has sponsored regional discussions on population aspects of social security schemes. De Piro (1972) a decade ago gave a brief review of some of the essential elements of social security programmes, identifying possible relations between social security benefits, population policies and family planning activities and indicating the nature of the work of the ILO Social Security Branch in the field of population issues.

The potential connections between social security cash benefits and fertility regulation have been noted to be especially those between old-age pensions, unemployment benefits and invalidity benefits, which if supplemented by adequate educational measures could shift traditional income maintenance protection from children and land rights to social security programmes. Listing the factors likely to have a bearing on reproductive motivation in social security programmes, De Piro (1972) noted the importance of such factors as the confidence of beneficiaries in the administration, application and long-term stability of such programmes, and the appreciation of the young of the income stability provided in old age through pension schemes. As he

emphasizes, however, a critical problem remains the difficulty of implementing unemployment schemes in countries with low wages, much unemployment and underemployment.

It has been freely admitted, however, that understanding and demonstrating the relationship between social programmes and population policies and changes observed in fertility behaviour is a difficult task (e.g., Mathew, 1973, p. 106). Japan has been cited as an example of a country in which drastic changes in attitudes to parental dependence on children during the 1950s and 1960s may have been linked, on the one hand, to increasing closure and functional individuation of the nuclear family and, on the other, to the development of social security programmes (Mathews p. 107). Pakistan has been cited as an example of a country in which old-age insurance schemes have been developed with a view to their impact on family size values and fertility regulation practices.

As Thadani (1980) has noted, the argument linking fertility to the net flow of resources between generations or to the "value of children" hinges upon the contribution of children relative to their costs and on the internal dynamics of the family. However, the problems of conceptualization and measurement are many and the flows of benefits may constitute the wages of migrant urban workers as well as farm and household labour (Standing, 1981) or the provision of home and maintenance for the aged. Three types of empirical work in several disciplines have been identified which try to estimate some such values or benefit flows during childhood. They include:

(a) Studies that estimate "actual" economic benefits and costs of children often in rural households. See, for instance, the time-use studies referred to above (or for example, Mueller, 1982) or Youssef's (1982) call for more data on the domestic division of labour, and Caldwell's (1982) recent discussion papers elaborating the significance of this question of the change in the direction of "wealth flows" in the domestic domain with reference mainly to Nigerian evidence. Cross-national data from 50 countries have suggested that child labour in household production is indeed positively associated with high fertility (Kasarda, 1971). And there is interesting evidence that in rural areas of the United States of America at the turn of the century low labour force employment of children and farm mechanization (integrally related characteristics) seemed to depress levels of marital fertility in many areas independent of the urban industrial system (Guest, 1981). Thus one of the major consequences of child work for household and individual behaviour outlined by Rodgers and Standing (1981) is that fertility can be expected to be higher where opportunity for child work is greater, in that parents benefit from their work and, as they note, a number of recent studies add support to this contention (e.g. Rosenzweig, 1978; Cain and Mozumder, 1980). Freedman (1981, p. 10) has recently demonstrated how Asian couples expecting neither co-residence nor financial support have lower fertility than any other categories and are the least traditional in all reproductive variables;

(b) Studies that look at the roles of children in a family or community context, in particular their social and cultural functions in addition to economic value. See, for instance, Safilios-Rothschild (1982) regarding the potential power that may accrue to parents from childbearing and rearing, or E. Goody (1982) on parenthood in Western Africa;

(c) Research that tries to measure individual perceptions of children through survey data often scaled, and through psychological measurement techniques to try to document statements about satisfactions and costs of children which can be classified as economic, psychological and social. Fawcett (1983) has recently evaluated the contributions of the last type of research. Many cross-national studies known as Value of Children (VOC) projects have been carried out (e.g., Arnold et al., 1976). Cross-national analysis has related changing perceptions of the costs and values of children, both with fertility and differences in patterns of child work (Bulatao, 1980). For example, Hogan and Frenzen (1981) related Thai couples' beliefs that intergenerational-wealth transfers favour children rather than parents and more innovative use of contraception.

Thus lack of incentives for fertility regulation, continuing high levels of fertility and the relative priority accorded the parental role in terms of social and economic status have frequently been associated with the material rewards and domestic supply of labour for farm business or household resulting from child work.

An important question still remains: the identification of those conditions in which child labour diminishes and in which costs and benefits are perceived to change. In some countries a clear contrast has been documented between mothers and fathers engaged in traditional, labour-intensive agricultural activities, who view their children as an important source of help in the fields, and those in urban areas where children are perceived as a source of expenditure and not income (e.g., Shoemaker, 1981). Lindert (1978, 1980) has argued that the relative costliness of extra children fails to rise until a fairly advanced stage of development and that couples consistently show unmistakable awareness of the economic effects of extra children in all settings. Obviously, the nature of the perceived costs and benefits of having an additional child will differ for each parent, depending on his or her concrete experience and on the cultural and structural conditions of the society that determine the division of labour and responsibilities and costs between them (United Nations, 1975, pp. 62-63; Oppong and Bleek, 1982). The perception of children as an important source of security in old age and sickness is likely to dwindle as adults have access to occupational opportunities, providing a range of possibilities for savings, pensions and social security benefits.

SEXUAL EQUALITY AND AUTONOMY:
CHANGING CONJUGAL ROLES

There is by now a widespread assumption that the restrictions and discrimination women experience in education, training, employment and community life adversely affect their power and resources available in the family context and strengthen the cultural pressures on women to define themselves as mothers and to concentrate their lives around their maternal and conjugal roles. Widespread lack of power and decision-making ability is perceived to be related to the lack of ability to control their own fertility. Thus it is widely accepted that improvement of their legal rights, improvement of their resources and opportunities such as training, jobs and incomes and fuller participation in community life are important factors affecting fertility levels and family planning (Safilios-Rothschild, 1982b). Consequently, much interest has been shown in demonstrating the potential links between sexual equality in the occupational sphere, women's status and autonomy relative to that of their male counterparts and fertility. This theme figured prominently in the 1974 World Population Conference and led to calls for abolition of sexual discrimination in employment and other fields. And in the section of the Conference Report dealing with population and the family, women's rights in decision-making, the elevation of their status and their integration in development on an equal basis with men were again stressed. Critical to these changes were listed girls' equal opportunities for education and vocational training and women's equal opportunities for self-realization with men in the home and society, as well as in the labour market.

Indeed education and labour force participation have been frequently used as proxies for sexual status and equality, and their correlations with fertility have been documented, but often the findings are inconclusive, unexpected or poorly understood in terms of the mechanisms of change and of the processes involved. Standing (1983) has reviewed the principal findings of the literature exploring interrelationships between fertility and female labour force participation, which uses the most common economic perspective. He notes in these studies a number of common methodological difficulties caused by the nature of the available data and the ambiguity of the hypothetical relationships involved. It has been difficult to demonstrate causality; moreover results have been varied and inconsistent, a basic problem being the inadequate documentation of women's work.

A variety of models of change have been proposed to help explain the intervening linkages between sexual divisions of labour and resources and opportunities in the occupational sphere, farm and market with fertility outcomes and expectations, using changes and differences in conjugal role relationships -- including "jointness", relative equality, syncretic decision-making, communication, dependence, autonomy and control or dominance. Each in some way attempts to link access to resources outside the domestic domain with domestic power and reproductive desires or activities.

Early examples demonstrating the potential links between wives' gainful employment outside the home, conjugal dominance patterns and family planning were the studies of Hill and collaborators in Puerto Rico (e.g., 1959). Later studies of this kind have included Rainwater (1965) and Scanzoni (1976 etc.) in the United States, Rosen and Simmons (1971) in Brazil, Oppong (1982d) on Ghana and others. Recent work on family role systems, exchange theory and rewards and costs in the domestic domain point the way to more sophisticated analyses in this area in the coming decade (e.g., Bagozzi and Van Loo, 1980 etc.; Nye, 1982; Scanzoni and Szinovacz, 1980). However, it must be noted that the studies cited above have all been carried out in contexts with sufficiently flexible social systems in which sexual bargaining is possible and in which conscious choice regarding contraception and the urge to innovate exist.

A considerable body of speculation and empirical evidence has in fact accumulated from many different socio-economic contexts attempting to relate women's and men's statuses (economic, political and social resources and rewards) in their occupational roles with their relative power as wives and husbands. Safilios-Rothschild (1982a) has proposed macro-level and micro-level indicators. There is a wide array of evidence to suggest that the more the resources a wife brings to marriage are equivalent to those of her husband, in terms of education, paid employment or her contribution to essential subsistence production, the greater the likelihood of conjugal equality, but shifts in such a direction also depend on the prevailing system of sexual stratification (Safilios-Rothschild, 1982b).

Relative equality or dominance of spouses has been related both to the conjugal, domestic and parental division of labour -- a more egalitarian relationship being associated with greater flexibility and sharing and also with a more syncretic decision-making process--and with more open and intimate communication. Each of these facets of conjugal role relationships have been linked in a variety of hypotheses with smaller family-size desires and achievements, more consistent contraception and greater ability to decide consciously, to formulate fertility plans and to execute them. Among the hypothesized relationships are the following:

Female economic autonomy and security. Female autonomy and security accruing from the occupational role will lead to less dependence on conjugal, kin and maternal economic status rewards and will lead to lower fertility desires and achievements and greater ability and propensity to use female-controlled methods of contraception. (An alternative causal sequence hypothesized is that decreasing conjugal and kin support leads to women's increased dependence on occupational role rewards and less interest in, or time for, child-rearing, and in the increased use of female-controlled contraception.)

Studies focusing on the potential associations between different fertility levels and sex segregation in labour markets are sparse, but studies do exist that link high fertility to women's dependence on husbands and sons in situations in which women find it impossible or difficult to be

self-supporting through employment (Cain, 1981, 1982). Other studies link women's increased chances for high status employment with divorce, reluctance to marry and lower fertility (e.g. Semyonov, 1980; Matthaei, 1980).

Female power accruing from relative resources in training and income. This increased power leads to enhanced influence in conjugal decision-making regarding fertility regulation and ability to achieve female fertility goals which may be lower than those of males. An alternative argument is that patriarchs gain from high fertility and seek to maintain it (e.g. Caldwell, 1982).

In several contexts more egalitarian roles or syncratic conjugal decision-making and less husband dominance or more wife autonomy have been associated with lower demand for children, lower actual fertility and more frequent and effective contraceptive use (e.g., see Oppong and Haavio-Mannila, 1979). Considerations of relative power and influence are obviously critical in contexts in which consciously discussed and negotiated behaviour occur and in which women and men have typically different expectations regarding parenthood and family size; in such cases the dominance of the partner wanting more or less offspring will be critical. Thus the relevance of "machismo" or male exercise of authority over women has been viewed in terms of its potential effect on fertility levels in Latin American countries (e.g., Hollerbach, 1980; and Shedlin and Hollerbach, 1978), and the necessity has been emphasized of considering both spouses as well as the pattern of interaction between them in studies of desired family size (Cochrane and Bean, 1976).

Recently, Beckman (1978) has reviewed social-psychological theory and research that pertain to how individuals and marital dyads form preferences and make choices regarding childbearing in the United States and other developed countries, since such conscious decision-making is thought to increase with modernization. Hollerbach (1980) has provided a theoretical framework linking the several identified bases of social power to types of decision-making. (See Scanzoni (1979) in Burr et al. (eds.) for a review of family power studies.) As Beckman (1983) emphasizes, this is an area in which pioneering research has shown how illuminating such a focus on conjugal equality can be, linking macro-factors such as labour market and modernization through changing conjugal roles with fertility (e.g. Rosen and Simmons, 1971). Far more studies of this kind are needed.4/

Male participation in domestic and parental tasks. "Jointness" of the conjugal role relationship as a result of female status equality and power (through occupational, educational and other resources) leads to male's perceived time and energy lack, to a realization of the time costs of parenting, to a desire for fewer offspring and to contraception.

In the past 20 years a considerable number of European and North American studies and a few from other parts of the world have demonstrated apparent associations between women's increased labour force participation and husband's increasing participation in household tasks, and changing

expectations with respect to these activities (e.g., Haavio-Mannila, 1967; Walker and Woods, 1976; Thornton and Freedman, 1979; Scanzoni and Szinovacz, 1980). Female employment has been viewed as positively related to a more flexible division of domestic tasks traditionally allocated to females.

Lemmenicier (1979), using an economic approach to the issue, has argued that husband and wife do not change their pattern of behaviour to a more "joint" one because the double career family choice is the best way of life, but because relative costs and prices of home-produced activities are changing. As time in the house becomes scarce there is pressure on husbands to share household tasks. As Lemmenicier notes, this results in an increased burden of roles for husbands, leading to the likelihood of conjugal role strain, tension and quarrelling, not to mention divorce.

Some have emphasized the status elements in the situation, considering simultaneously husbands' and wives' statuses and seeing the performance of low-status family roles (housework and child-care) as the result of the relative status of the husband and wife (e.g., Erikson et al., 1979). Others have emphasized the bargaining element and the relative power and resources of the spouses (Matthaei, 1980, regarding the United States; Oppong, 1982d, regarding Ghana). This approach has been found appropriate for couples in cultural contexts with a relatively flexible and egalitarian gender framework.

It is significant that norms, values and behaviour associated with increased flexibility and equality in the conjugal division of labour have been correlated with views and practices regarding smaller family and fertility regulation. Rainwater (1965) clearly spelt out such relationships in terms of perceptions of role stress or strain or costs to the actors concerned. Subsequent studies have confirmed his finding in different contexts (e.g., Erikson et al., 1979; Scanzoni, 1976), and data from Africa have been used to show the combined effects of role substitution and resource availability on perceptions of role strain and changing fertility values among teachers who are fathers (Oppong, 1983). Howell's (1979) data from the Malaysian rain forest show that such effects are found in societies at various levels of economic and technological development. Data from Thailand have also provided empirical evidence of contraceptive innovation among couples in which wives have more equal roles (Hogan and Frenzen, 1981).

Conjugal equality and intimacy and communication. Conjugal equality associated with similarity or complementarity of occupational and domestic resources and activities will be correlated with enhanced communication and the capacity to plan essential for enunciating, deciding and achieving fertility goals.

Significantly, conjugal equality, shown in many settings to be related to a more joint/flexible division of labour in the home and syncratic patterns of decision-making, has also been linked to improved communication relevant to facilitating the planning of births and to small family desires and effective planning (e.g. Back and Hass, 1973).

Beshers (1967, pp. 61, 96) in his work on population processes in social systems made the important point that planning of family size implies a syncratic decision-making process between husband and wife, that the two-person decision-making process is crucial to fertility theory. Regarding societies with extremely segregated female and male roles, he noted that this segregation will restrict communication essential to conjugal decision-making (see also Strodtbeck, 1978). Conjugal equality, "jointness" and free communication are not necessarily associated, but often a positive relationship between egalitarian power relationships and couple communication is noted (e.g., ESCAP, 1974) and between the latter and higher education and occupational levels (e.g., Rainwater, 1965; Stokes and Dudley, 1972; Hill et al., 1959). More frequent discussion between wives and husbands (about family planning) has also been associated with greater fertility regulation (in terms of ever used contraception, current use, length of use and effectiveness of use).^{5/}

The diversity and scope of evidence attempting to link equality in the occupational sphere with conjugal equality in the domestic domain and their links potentially with differential fertility and its regulation have now been indicated. However, such links may only be effective in certain cultural contexts. Rigid sex stratification which might inhibit such processes characterizes some countries. In such cultural contexts women cannot without difficulty either live autonomously (without the protection and control of men) or make important decisions or manage resources alone or have flexible egalitarian conjugal role relationships. Women tend to be defined by their roles as kin, wives and mothers, leading to their reliance upon the birth of sons for power, security and prestige.

A number of observers have remarked that in the past one or two decades the most significant declines in fertility have occurred in societies (with various levels of per capita income) in which there have been the most concerted attempts at equal distribution of resources between status groups, in particular women and men (Safilios-Rothschild, 1982b). To lessen the male/female gap in resources and power a key issue is the expansion of income-generating activities for women—income that is continuous and secure and not connected with family ties. Certainly there is empirical support for the contention that it is when women have feelings of efficacy and control based upon access to needed resources to improve the lives of themselves and their children that they tend to be more responsive to family planning than other, low income women (e.g., Huston, 1978; Reining et. al., 1977). Thus it is critical, as Safilios-Rothschild (1982b) has stressed, that instead of development effects that reinforce women's dependence on men, programmes are needed that can help to break women's dependence on men by providing them with possibilities for a stable and substantial economic identity and autonomy.

Occupational equality and protection:
some ILO activities

The ILO has sponsored and carried out a range of programmes related to sexual equality in the occupational sphere, thus connecting ILO labour laws and policies on sexual equality with fertility through these potential intervening effects on familial roles (see figure I).

Numerous ILO studies have analysed factors having potential impacts on the labour force participation of women in different countries and at different stages of development, examining how trends are affected among other things by women's relative access to education and training, and job opportunities in contrasting types of occupational structure, both rural and urban and in migrant and settled populations (e.g., Standing, 1978; Standing and Sheehan (eds.) 1978).

Some of the studies have focused on potential associations between women's participation in the labour force of different countries and their fertility, among other issues (e.g., Standing, 1980; Robinson and Stephenson, 1980). Compilation of global, regional and national statistics and information is a basic source of evidence of difference and change. Country case studies in which women's issues form a component or a major focus are also an indispensable part of the documentation process (e.g., Molyneux, 1982). Recently, more attention has been concentrated on the potential effects with regard to conservatism or change, whether for enhancement or deterioration of women's roles, of a number of factors (e.g., business cycles, Werneke, 1978).

Interest in the work of women carried out in familial settings, either the farm, market or household, has grown, partly with a view to documenting what was previously "invisible" and partly with a view to improving the data base on which policies and programmes can be based, and on which economic and demographic changes or lack of change can be understood (e.g., Bhatti, 1980; Mies, 1980; Lynch, 1983). Indeed, unpaid work and domestic activities have become a special focus of increasing attention and concern resulting in a number of studies (e.g., Date-Bah and Stevens, 1981; Goldschmidt-Clermont, 1982).

A range of inquiries have compiled evidence from around the world of forms of occupational segregation detrimental to women (e.g., Standing, 1978b). A major issue remains the expectations and activities associated with their roles as mother, wife and housewife which constrain the time and energy available for devotion to paid occupations outside the home. Recently, measures adopted in some European countries to improve maternity protection and to enable women workers to reconcile their maternal and occupational roles without undermining equality have been examined. Other studies of the interactions between familial or domestic and occupational roles have included the impacts of female employment on family life (Soffan, 1980); the need for child-care policies for working parents (Seguret, 1981); the effects of

provision of facilities and child-care (ILO, 1980); the effects of technological change and production and women's domestic decision-making (Kelkar, 1981; Ferge, 1976); and the composition of the domestic group in relation to married female employment (Peek, 1975). An interesting series of studies has also been carried out recently in European socialist countries committed to the relative equality of women and men in the occupational sphere. A focus of these studies is the potential impacts of population policies, in particular benefits to working mothers, on fertility levels. The tentative conclusions are that while such benefits and policies have an effect on the timing of births, it is uncertain whether or not there is any ultimate effect on completed family size (Anker and Bodrova (eds.), in press).

A global task remains the improved documentation of the comparative position of women around the world in different countries with regard to equality of opportunity and treatment in the occupational sphere. The increase of training and employment opportunities for women workers as well as other social groups is an important goal of ILO work and includes the issue of diversification of women's employment and positive discrimination and identification of traditional obstacles to such equality.

The strengthening and improvement of the effectiveness of government agencies set up for the promotion of women workers and the promotion of social policies and programmes to encourage equal opportunities and treatment are important means of action. In addition, consciousness-raising and dissemination of information, particularly with respect to the areas of progress and issues in which there is a lack of improvement in the past decades in women's work roles remain priorities.

In view of the pervasive inequities experienced by women in working life, an important part of the work of the ILO is the promotion of protective measures for women.^{6/} Thus over the years the ILO has adopted a number of conventions which member nations have been expected to ratify as part of their national labour codes, including prohibitions against night-work, lifting heavy weights and underground work. Among these measures maternity protection plays an important part.^{7/} Rights and legal provisions for childbirth and the succeeding months vary very much among nations from provisions of lengthy paid child-care leave to a national health insurance plan covering medical expenses including those of childbirth to lack of any provision. A particular concern is legislation affecting pregnant women and nursing mothers and the ways of combining nursing, infant care and occupational responsibilities (e.g., Korchounova, 1979). Country studies have assessed the impacts of such protective legislation (e.g. Smirnov, 1978). A difficult task remains the assessment of the extent to which protective legislation contributes to sex-stereotyping of certain occupations or discourages employment in them. The application and observance of such conventions and recommendations require constant monitoring.

An important aspect of equality of opportunity for women is their access to social security benefits, including pensions and family allowances etc., and the improvement of their relatively deprived position in this respect is

an important aspect of ILO work, which also deals with discrimination particularly against married women and the elderly and widows (see Voirin, 1982).

Moreover, there is a growing focus on the necessity for equalization and flexibility of roles women and men play not only in the work place but also in the home, and a recognition of the fact that the goal of equality between the sexes involves changes in men's roles and life patterns as well as women's (e.g., OECD, 1979, p. 12). Indeed, the necessary connection between equality in the occupational sphere and in the domestic domain is increasingly discussed. Hence the impacts of family responsibilities on working women's and men's occupational roles have become an important subject of concern. There is an assumption in some countries, such as Finland, that both parents play an active part in child-care and therefore both require appropriate benefits.

Significantly, when the Conference adopted in 1975 the Declaration on Equality of Opportunity and Treatment for Women Workers it already recognized that women's position could not be changed unless there were corresponding changes in the roles of men within the family. In November 1978 the Governing Body of ILO decided to place this question on the conference agenda seeking to take the ILO's standard-setting activity a step further towards complete equality of opportunity and treatment for men and women workers in employment and occupations. Thus, the sixty-sixth session of the International Labour Conference held in Geneva in 1980 included among its technical items for discussion equal opportunities and equal treatment for men and women workers, and the sixty-seventh session, in 1981, witnessed the passing of Convention 156 concerning "Equal opportunities and equal treatment for men and women workers: workers with family responsibilities".

There is thus, on the one hand, an expanding ILO programme of legislation, documentation and action-oriented work concerned with the occupational and familial equality of the sexes and, on the other, a growing body of data supporting hypothesized links between such equality of female and male roles and lower fertility.

EXPANSION OF TRAINING EMPLOYMENT AND INCOME-EARNING OPPORTUNITIES: CHANGING KIN ROLES AND INDIVIDUALS

A considerable amount of the work of the ILO is concerned with the expansion and improvement of opportunities for training, vocational guidance and modern sector employment for both women and men. Numerous attempts have been made by scholars of various disciplines using statistics on education, training, employment status and income levels to establish links between these and fertility differentials and changes, in particular conscious fertility regulation by modern methods. As in other attempts to link single variables, such as levels of child or female employment with reproductive change, results have been varied and sometimes contradictory. This section focuses on a

variety of hypotheses and empirical evidence used in attempts to employ some kind of a model of changing familial roles as the intervening link connecting the expansion of training and modern sector employment with fertility and its regulation.

Some hypothesized associations

(a) Effects of the separation of kin:

- (i) Increased freedom of couples from traditional pronatalist pressures of kin - value change and increased autonomy;
- (ii) Increased freedom from restraints of kin and thus more opportunities for couples to innovate in matters of contraception etc.;
- (iii) Increased potential for "jointness" of the conjugal role relationship among couples living together in isolation from kin (and thus the potential for change effects noted above);
- (iv) A change from "extended" to "nuclear" families, increasing functional boundedness of the conjugal family or nuclear family "closure" with the distancing of kin, leading to concentration of resources and emotions within the conjugal family, hypothesized to be associated with lower fertility desires and achievements through changes in the nature of exchanges and interactions (including increased emphasis on quality of relationships - intimacy, achievement orientation, companionship etc., or increased salience of the finite and calculable nature of resources in time, energy and material goods once the unit of calculation is smaller and more precisely defined);
- (v) Decreasing opportunities to delegate and share parental responsibilities between siblings and parents and children, thus increasing solo shouldering of such responsibilities with associated tendencies for role strain, role conflict and the urge to regulate births.

(b) Increased individualism, self-centred gratification and solitary living:

- (i) Decreased dependency on any familial sources of support and maintenance and increased propensity or potential for individuals to live and survive securely alone without co-resident family members, and substitution of friendship for kinship as a source of emotional security;
- (ii) Increased individualism/narcissism--concentration of resources in time, money etc. upon self and improved levels of living and leisure at the expense of familial roles, including the parental.

Kinship, individualism and parenthood

Attempts to link shifts from kinship solidarity to individualism, from "extended familism" to "nuclear familism", from lineage solidarity to conjugal solidarity, have been phrased in various ways, and many attempts have been made to link these changes to the lowering of fertility levels and desires by economists, demographers, anthropologists and sociologists (e.g., Blandy, 1980; MacFarlane, 1978a and b; Stone, 1977; Caldwell, 1982). Tests of relationships between so-called "extendedness of family structure" and fertility have found unclear and conflicting relationships (e.g., Cogswell and Sussman, 1979, p. 195; Khan, Cogswell and Thomas, 1980). This is not surprising since the usual index has simply been residence. Thus, the realization has grown that it is more useful to look at decision-making, divisions of labour and resource allocation in examining the extent to which individuals operate separately from kin.

Several works from the contemporary developing world in which education, migration and employment are linked with changing family relationships and family size and contraception come from Ghana and Nigeria. Caldwell (1982 etc.), in a series of papers and books, has attempted to trace links between "Westernization" and "modernization", closer conjugal bonds, changes in the sentimental and economic ties between spouses, parents and children and kin. His theses warrant detailed attention because of their imaginative attempts to confront and weld together hypotheses about change of several kinds - emotional, ideological, material, political and demographic, and because of the pervasive realization of the importance of examining and measuring changes in family relationships, in view of their crucial connection to the understanding of demographic and contraceptive innovation.

In this regard a pertinent ILO case study is that of Standing (1981) in Jamaica in which he clearly relates the lack of economic security and employment opportunities, the "openness", "looseness", "informality" of the conjugal family structure, the lack of individuation and autonomy of parental roles to the patterns of procreation. Other recent ILO case studies and analyses supportive of several of these hypotheses linking occupational roles, familial roles and fertility regulation, in particular aspects of kin support, conjugal family closure and individualism with fertility and its regulation, include work from Ghana utilizing a range of different types of data sets from educated migrant and non-migrant workers (Oppong, 1982e, 1983b; Oppong and Abu, 1983).

CONCLUDING COMMENTS

Much statistical work has been carried out by scholars of several disciplines attempting to link the reduction of child labour, social security measures, women's labour force participation, individual access to training, employment and relatively high income levels, to the lowering of levels of

fertility aspirations and achievements. From a global perspective fertility rates are noted to remain high in regions of the world where children continue to supply an important source of labour to their parents and other elders and where women lack equality of opportunity in labour markets and remain dependent throughout life on kin, husbands and sons. On the other hand, in countries where old and young are effectively protected by child labour laws and social security systems and the sexes are relatively equal with respect to training and employment, problems of fertility rates being perceived as too low are encountered and corresponding policies to lighten parental burdens and increase benefits of childbearing have been introduced.

Although globally associations between these labour variables and fertility have been demonstrated, at the macro-level findings have often been varied and have shown inconclusive or conflicting results in different cultural and socio-economic contexts. This has been the case particularly, for instance, with regard to women's work. Moreover, the change mechanisms involved have not been well understood (e.g., Miro, 1980, p. 346).

This chapter calls attention, on the one hand, to ILO endeavours in the spheres of protection of the young and old, sexual equality, and expansion of individual training and employment opportunities, which are demonstrated to be relevant factors in fertility decline. On the other hand, it points out a variety of documentary work on changing familial roles and relationships which serves in many cases to provide the needed links between the altering divisions of labour, work opportunities and resources and changes in the domestic domain, which, in turn, are linked to reproductive expectations and activities and to different and changing fertility outcomes.

A thrust of the paper is thus to emphasize the critical intervening nature of changing familial roles, which have often been neglected, both in labour reports and related activities, on the one hand, and in the documentation and policy-making related to fertility, on the other.

During the past decade there has been a growing recognition by demographers, economists and others interested in fertility levels of the relevance of family systems and changing familial roles. There has been a noticeable increase in the attention devoted to familial responsibilities and activities by the ILO in terms of studies, conventions, recommendations and activities. Moreover, there is a conscious attempt in some on-going research to focus on the ways in which interactions between multiple role expectations and behaviours within both the occupational and domestic domains (which may, of course, be overlapping) relate to reproduction. Thus, in a number of studies, women's roles as mothers and workers in different contexts - households, markets, factories farms—are being examined in the light of changes taking place in modes of production and processing as a result of industrialization, such as the introduction of improved technology, shifts in trading patterns, and the pervasive influence of sexist ideologies and practices which allow women unequal access to jobs, income, leisure and opportunities for self-improvement (e.g., Gulati, 1983). Goals of these studies include, as well as the improved documentation of women's work, a

better understanding at the micro-level of interactions between women's several roles and their associated statuses vis-a-vis men and fertility aspirations and outcomes. The welding of contrasting methods and approaches has been another goal of these studies, which have laid the ground for an expansion of effort to improve the documentation of women's work and are to be linked with family welfare and action programmes enhancing the understanding of micro-change processes in different cultural environments. A more careful specification of the demands of occupational and familial roles and the availability of familial resources is helping to elucidate the interrelationships between women's work of different kinds and fertility-related behaviour and expectations.

Thus, for instance, Lynch's (1983) Egyptian case studies of craftswomen have indicated both subtle and profound differences in women's fertility-related aspirations and behaviour, which appear to be linked to differences in their maternal and conjugal role relationships and how these interact with their labour requirements and resource availability and control. Hein (1982) and Date-Bah (1982), in documenting the industrial and familial roles of women in Ghanaian and Mauritian factories, have demonstrated the necessity for analysing data on conjugal and kin roles, if the aspirations and activities connected both to industrial employment and motherhood are to be understood. These and other case studies demonstrate how changes in the costs and benefits associated with familial roles and in the sources of current maintenance, long-term security, status and power are linked to critical changes in fertility-related activities and with expectations associated with familial roles. These include increased perceptions of parental role strain, diminishing perceptions of children as a source of economic security and labour, thus changing family size values; changes in the perception of marriage as a major source of economic security for women and consequent increases in the proportions of unmarried, as well as an increased power of wives vis-a-vis husbands and a decreasing power of kin. At the same time separation of occupational and familial spheres occasions increased conflict between occupational and parental roles, with consequent potential impacts on fertility and a pervasive increase in individual responsibility for parenthood. Thus, micro-evidence from a variety of cultural contexts shows how changes and differences in allocations of tasks and resources and status benefits between kin, parents and offspring, wives and husbands are associated with changes and differences in fertility-related aspirations and patterns of regulation.

Finally, the discussion has served to underline the pervasive and profound nature of the potential impacts of divisions of labour and employment policies on fertility levels, demonstrating that changes in familial roles and relationships are central to this process of linkage. Thus, the need is made apparent for more knowledge and understanding of the dynamics of change in this area at the micro-level and in a variety of cultural areas, if government policies and programmes are to achieve their specific goals with respect both to employment and demographic policies.

Notes

1/ A longer, more copiously documented version of this essay, including an appendix of selected international conventions and recommendations, appeared as Working Paper no. 124 in the Population and Labour Policies Programme series of the World Employment Programme of ILO.

2/ This supposition was given global empirical support by World Fertility Survey data which showed women's work status appeared to have a significant association with fertility levels in 19 out of 27 populations studied (Rodriguez and Cleland, 1981). However, the same data sets have not shown clear relationships between employment status and contraception (Mamlouk, 1982) and a recent United Nations study (1980) concluded that education accounted for most of the difference in contraceptive use by employment status.

3/ Doctor (1972a) noted that a study using regression analysis and employing data from an international cross-section of countries found a negative correlation between fertility and child labour laws for both developed and developing countries. See S. Friedlander and M. Silver (1967, pp. 48 and 55). See also Measures, Policies and Programmes Affecting Fertility, with Particular Reference to National Family Planning Programmes (United Nations publication, Sales No. E.72.XIII.2), pp. 36-37, which briefly discusses effects of child labour laws and compulsory school attendance on fertility, and see pp. 17-29 for discussion of possible effects on fertility of child allowances and tax benefits.

4/ Scanzoni (1976 etc.) shows its relevance using United States data. Some Ghanaian evidence provides parallels (Oppong, 1982e). Bagozzi and Van Loo (1978) have attempted to develop an interactionist model in which role expectations, social exchanges between family members and socio-economic constraints and resources have a place. Their model includes norms, sanctions, power and conflict and indicates the need for increased concern with power and choice in decision-making.

5/ Samples of such findings have come from Asia (e.g., ESCAP, 1974); Africa (Kar and Talbot, 1980); United States (Rainwater, 1965); Latin America (Hill et al., 1959; Kar and Talbot, 1980; Stycos and Black, 1964). Hill and others (1968), Lui and others (1970), Rosen and Simmons (1971), Lui and Hutchinson (1974) have supportive findings.

6/ For a compilation of texts of ILO conventions, recommendations and resolutions pertaining to women workers which presents standards adopted at ILO regional conferences and ILO meetings of women's rights to equal opportunities in employment and working conditions, see "ILO selected standards and policy statements of special interest to women workers", adopted under the auspices of the International Labour Office, Geneva, 1980. For a complete text of all conventions see International Labour Conventions and Recommendations 1911-1981, arranged by subject matter (ILO, 1982).

7/ For a study of legislation relating to nursing breaks and facilities for working mothers in selected countries, see "General conditions of work" series, no. 28, 1974; for a pamphlet giving a comparative overview of labour law provisions with respect to occupational safety and health which notes the growing emphasis on the concept of maternity protection see ILO, ITS series, "Sécurité, hygiène et médecine du travail", 1974. Attitudes on the amount of protection which should be afforded female workers in view of their maternal roles have varied. Thus, for example, the position adopted by the French Committee on Women's Work has been that maternity (pregnancy and confinement) annually affects only 6 per cent of working women and the following period of family activity involving child-care until adulthood calls for protection which should benefit fathers as well as mothers (Devaud and Levy, 1980). See also Women at Work, No. 1 (Geneva, ILO, 1982), pp. 19-24.

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C. Fertility, family and health:
some current issues

World Health Organization

INTRODUCTION

The family, in most cultures, provides the immediate frame for fertility-related behaviour, including childbearing, child-rearing and fertility regulation. The family is also the basic unit of health care, with a vital role in health promotion and in the prevention, early diagnosis and treatment of disease. It is the family - in general the mother - that rears the children, cares for the sick and the elderly, determines the diet, maintains the immediate environment, transmits attitudes and lifestyles, and decides when to have recourse to the health services. The family, and in particular the nuclear family, can thus be seen as a main mediating structure for a number of important interactions with changes in patterns of fertility and of health. The gradual shift from extended families to nuclear families and the increasing frequency of single parent families and single person households are symptoms of such changes. As an area of analysis, the triangle between fertility, family and health is of necessity fairly loosely defined, since all three cornerstones, family, fertility and health, are complex and multidimensional concepts in themselves. It is nevertheless a useful tool in focusing attention on micro-level interactions and on the social, legal and political interventions which effect them.

This paper provides a brief overview of some of the interactions. Special attention is paid to recent changes and to those occurring on a global scale, and to the possible influence exerted by policies and programmes, as well as by community action, in this area. The basic health rationale for family planning, i.e., avoiding the health risks for mother and child of pregnancies occurring too early or too late in life and/or too closely spaced, was already prominent in the 1974 World Population Plan of Action (WPPA) and is therefore not elaborated on here.

HEALTH ASPECTS OF FERTILITY REGULATION

There has been a slight but perceptible downward trend in the global level of fertility in recent years. Concurrently, there has been a steady increase in contraceptive use in many parts of the world and in particular an increased use of more effective methods. A global estimate of the number of contraceptive users in 1980 is given as: "Out of a world total of about one

billion couples of reproductive age, approximately 300 million are at present using modern methods of contraception; in developing countries it is estimated that out of approximately 600 million couples, about 100 are doing so".

The increased use of contraception is especially marked in the urban sectors of developing countries and especially among women and couples in their thirties. In many countries the trend has not yet touched some of the rural areas or all population groups, and there is still much to be done before the fulfilment of the goal of the 1974 WPPA, that all couples shall have access to information and services to enable them to decide when and how many children they want. The World Fertility Survey (WFS) found that in most developing countries there was still a large unmet need for family planning. In nearly all countries surveyed less than half the women who were exposed to the risk of becoming pregnant and who did not want any more children were using contraception. In three countries of Asia (Bangladesh, Nepal and Pakistan) the equivalent proportion was found to be below 15 per cent. In most other countries it was between 30-40 per cent. A significant proportion of these "at risk" women, who are not using contraception, would like to do so but do not know of, or do not have access to, a source of supply. The problem of physical access is particularly acute in many rural areas. In urban areas, where use rates are much higher, there is usually a source within 15 minutes travel time. It is significant that in the two developing countries with the highest rural use rates (Costa Rica, 25 per cent, and Thailand, 23 per cent) rural women reported a source less than 30 minutes away. In general the longer the reported travel time to a source the lower the reported prevalence rate.

Physical access also affects the choice of method. In general, sterilization and intra-uterine device (IUD) insertion involve longer travel time and greater inconvenience than the procurement of supplies of oral contraceptives or condoms. Such perceived inconvenience can be an impediment to service delivery.

A large and increasing number of couples complete their planned childbearing long before the woman's menopause and can thus expect to live for many years of sexual activity during which they need effective protection against pregnancy. With the number of users increasing, the social range of contraceptors widening and the age span of contraceptive need lengthening, the availability, safety and accessibility of contraceptive methods become increasingly important. Health risks which seem quite modest and acceptable from an individual's point of view could become serious public health problems because of the sheer numbers involved.

Particular attention is being given to the possible health risks associated with widespread and prolonged use of oral contraceptives. It is generally agreed that these risks, although minimal, consist mainly of an increased incidence of diseases of the circulatory system (venous thromboembolism, ischemic heart disease, cerebrovascular disease and hypertension). These risks increase with age, especially in women who smoke. Most of the studies that have revealed these facts have been conducted in

developed countries and it is still an open question to what extent the findings apply to women in developing countries who often have less good general health. To answer this question, much more research will be needed in the years to come. Not all of the health effects of oral contraceptives are negative; some are beneficial. The most important of these is probably a reduced incidence of anaemia due to a decrease in menstrual blood loss and a reduced incidence of pelvic inflammatory disease, which otherwise is on the increase and in many populations is the direct cause of infertility.

Another contraceptive method which has been the subject of much controversy in recent years is the injectable contraceptives, in particular Depoprovera (DMPA) which has not been approved for use in the United States of America. However, clinical evidence from more than 15 years of use as contraceptive agents in other countries shows no additional and possibly fewer adverse effects than are found with other hormonal methods of contraception. The particular advantages of DMPA and NET-EN as highly effective, long-lasting and reversible contraceptives make them important as options for women requiring a method of fertility regulation.

However, the full range of health effects of any method of contraception cannot be limited to just a listing of specific, clinical risks and benefits. It is necessary to balance these against the health risks involved in the alternatives: in getting pregnant and having an abortion, in complications of delivery, as well as in the availability and health risks of other contraceptive methods.

Significant improvements have been made, and continue to be made, in the techniques for female sterilization. The intervention is a relatively minor one, usually done under local anaesthesia only, with a low inherent risk when carried out on a healthy woman under aseptic conditions. In spite of the great efficacy and other advantages of sterilization as a contraceptive method, it is still not fully acceptable in some cultures and to some women, including those who fear a divorce. Much of this resistance and reluctance would no doubt disappear if a way could be found to make the intervention more easily reversible. Most current methods can in theory be reversed, but only through a major and delicate operation with a relatively modest chance of success. There is here an area for research and development of major relevance to reproductive health, as well as to fertility regulation proper. Even without such a breakthrough it has been estimated that the demand for sterilization (male and female) during the 1980s may account for some 180 million interventions, in addition to the approximately 60 million women and 40 million men who were sterilized around 1980. In any case, the rapidly increasing demand for sterilization will require considerable expansion during the 1980s of the existing service capacity in most countries.

Without effective contraception of any type, an increasing number of women resort to induced abortion. Current estimates place the total number of abortions taking place each year between 30 and 55 million. About half of them are illegal, and more than half take place in developing countries. In some Latin American and Asian countries as many as one of every three or four women has had an induced abortion.

Illegal abortions in developing countries kill as many as 5 to 100 women per 100,000 procedures. It is 10 to 250 times more dangerous than any kind of contraceptive measure and is a major cause of maternal mortality in developing countries.

The legal status of abortion ranges from complete prohibition to elective abortion at the request of the pregnant woman. Nine per cent of the world's population live in countries where abortion is prohibited without exception and 19 per cent in countries where it is permitted only to save the life of the pregnant woman. Most of the Muslim countries of Asia and most of Latin America and Africa fall into these categories.

Carried out by a qualified person and with the appropriate techniques, abortion carries a very low risk of physical complications or sequelae if done during the first trimester. It has come to be regarded in many areas as a necessary backstop to family planning services in cases of contraceptive failure.

The principal clients for abortion, whether clandestine or legal, used to be women in their late thirties to early forties who do not want to have additional children. With the more widespread sexual activity before marriage, which is becoming common in many populations, another important client for abortion is the unmarried adolescent women. Both groups are strongly motivated to seek abortion and in countries where this is illegal, they run considerable risks by seeking clandestine abortion.

In this context, it has been estimated that the average woman aged 30, in a developing country, who is "exposed" to childbearing until the menopause, has the following probabilities of dying during that period of causes associated with reproduction: 2 per cent if not contracepting; 0.2 per cent if taking oral contraceptives during the whole period; 0.02 per cent if she is sterilized. For other alternatives (but not including the alternative of an illegal abortion), e.g., taking oral contraceptives until she is 35 years old and then using a barrier method until menopause, the probabilities are of some intermediate value.

CHANGING FAMILY PATTERNS

The process of modernization, urbanization and the large-scale migrations that are taking place in many areas of the world often imply and/or cause dramatic changes in the traditional life-styles of the people concerned, including changes in the structure and functions of the family and in the patterns of family formation and dissolution. In recent years, changes in the status of women, and the growing awareness of the role women play in development, have accentuated some of these changes in family patterns.

These changes involve several aspects: the shift from extended to nuclear family, such as typically happens when a young couple migrates from its rural origin to an urban area; more single persons, typically found in

urbanized post-industrialized societies; and more single-parent families (usually a mother and her children) which may be a more or less temporary phenomenon resulting from migration of the husband in search of work, but may also be the result of women migrating to towns and having children without forming any stable union.

The effects of changing family patterns on the fertility and health of its members are diverse and not easy to generalize. For example, if migration takes place primarily as a result of the pull factors, such as those that attract many immigrants from the Indian sub-continent to the Gulf States, it is likely to benefit physical health, owing to better health care and improved living conditions, but it may create psychosocial problems. Migration to peri-urban slums, such as that taking place from rural areas of Latin America, causes an uprooting and new life-style which may cause a deterioration in the mental and physical health of the migrants, as well as severe problems for those left behind, in the most part the older members of the family.

This uprooting of families and individuals is often accompanied by, or maybe is only concurrent with, general changes in the sexual attitudes and behaviour of many communities, one result of which is the widespread, steady increase in the incidence of sexually transmitted diseases and their sequelae.

It is equally difficult to generalize about the effects on fertility and health of trends away from extended families and towards nuclear and single-parent families. Nuclear and single parent families require more care and support from the community than do the members of extended families. Where this support is not forthcoming, as in most peri-urban slums, the new family types become less favourable for health than the traditional patterns with their built-in support systems. Two population groups in particular have been the centre of attention during the past decade as being particularly at risk as a result of changing family patterns; these are the adolescents and the elderly, as discussed in more detail below.

The importance of the family as a social unit of health care, of life-style and of reproduction is usually not reflected in the available official demographic data. There is still a strong tradition of treating the person as an individual, rather than as a member of a family, and to focus attention on the male head of household, tacitly assuming that the wife and children will take their characteristics from him. There is a clear challenge for innovation in family statistics, starting from the 1980 round of censuses, as an information base for strengthened community support to family functioning.

In addition to the more dynamic changes in family typology, there is a universal, although uneven, trend towards smaller families. While the reduction of average family size from eight children or more, to say, three or four children, undoubtedly has health benefits for the mother as well as for her children, it is more difficult to argue that a two-child, or a one-child family norm can be justified by health reasons alone. Such reductions go beyond what is required by health considerations - to avoid childbearing at too young or too old an age, with birth intervals of two or more years.

The one-child family, in particular, has attracted attention in recent years because of the adoption by China of the one-child norm as a national goal. The full range of implications in terms of fertility and health of this decision are yet to be explored, since no similar experience on such a large scale has been known in history. As for fertility, it is obvious that the one-child norm will further prolong the previously mentioned period of non-childbearing sexual activity; hence the problems of contraceptive methods and their efficacy, acceptability and reversability become even more important. As to the health effects of the one-child norm, there is in some countries a popular belief that the only child is more prone to psychosocial problems, but such studies as exist do not seem to confirm this hypothesis. With regard to China, one health care effect that has already manifested itself is a greatly increased interest in and attention to child care. If one can have only one child, then the health and welfare of that child obviously become a matter of utmost importance.

A more indirect consequence of the one-child norm is its potential effect on the care of the elderly. In this respect, the example of present-day China serves as a useful illustration. There, the support of the elderly, i.e., those who no longer work on a full-time basis, is still basically the responsibility of the family and sometimes of the local community. There is as yet no national old-age security system, although various pension schemes exist at sub-national levels.

The one-child norm, if strictly applied for some time, would clearly upset the numerical balance between generations and increase the burden on the younger generation. The vision of a young couple having to care for four dependent parents and possibly some surviving grandparents is clearly not very acceptable in a traditionally family-centred culture. Of course, the one-child norm represents an extreme situation, but the same problems are inherent in any drastic reduction in family size. If the one-child (or fewer children) norm is to be accepted by the parents of today, credible community guarantees for old-age support must first be demonstrated.

With reductions in mortality, both the number and proportion of elderly persons is increasing in all communities. In many developed countries, where most of the burden of support to the elderly has been shouldered by the public for a long time, there is now an increasing interest in the revival of a family care system. This is not merely a question of money, but rather one of sheer arithmetic. For example, if the prevalence of debilitating conditions increases steeply with age, and if the proportion of people over 80 increases five-fold in the next 20 years, it will hardly be practical to give institutional public care to all such cases. New approaches may or may not lead to a shift towards more extended families, but it is obvious that their success or failure will influence the fertility pattern of the current childbearing generation, through its expectations for care in its own old age.

Adolescence is a period characterized by rapid development and drastic change, both physical and social. Attainment of sexual maturity permits the onset of reproductive behaviour, but the first few years after the onset of

fecundity are not optimal for healthy reproduction. Very young mothers have a higher rate of maternal mortality and their infants higher rates of low birth weight, perinatal mortality and infant mortality. Teenage fertility represents a cause of concern in some developed countries, but it is an important problem in many of the developing countries, too. In rapidly urbanizing areas there is a shift towards later marriage, more premarital sex and more unwanted pregnancies. Effective provision of contraceptive services to young unmarried teenagers is difficult, and improvements will have to include a change of attitude by policy-makers, service providers and others.

The pattern of sexual activity during adolescence varies tremendously between cultures, from the relatively permissive attitude of premarital sex and pregnancy in North American, European and many African countries to the strong social pressure for preservation of virginity until marriage that characterizes traditional Muslim and Asian cultures. The latter, however, does not automatically imply a postponement of sexual activity and pregnancy to adulthood. On the contrary, in some traditional societies the percentage of married adolescents is very high, for example, around 1975, for women of 17 years this percentage was 76 per cent in Bangladesh, 38 per cent in Indonesia, 29 per cent in Lesotho, 25 per cent in Syrian Arab Republic and 14 per cent in Haiti. Usually, in such societies, once married, women must prove their fecundity in the shortest possible time, so that the first child is very often born before the mother is fully mature with all the associated health risks for both mother and child. Family planning is not seen as appropriate until the desired family size is reached. It seems highly likely that reductions in adolescent fertility in such societies can only be achieved through a later age at marriage - as is indeed happening in many developing countries. Policies to this end include those promoting the education of women and improving their status as well as raising community awareness of the health problems involved.

Immigrant teenagers, whether in another country or in a large town, are particularly susceptible to the adverse psychological and other health effects of migration. Not enough is known about the factors affecting their health or the risk they run of specific health problems which will affect their adult health and future development, including fertility.

In modern society, the situation of adolescents is undergoing rapid and fundamental changes. There is, in many parts of the world, a loosening of the traditional family ties which get replaced by a stronger, direct peer group influence. This process calls for an increase in community and family responsibility for and involvement with the health and well-being of a group that will in their turn become the parents of tomorrow.

CHANGING HEALTH-RELATED FAMILY BEHAVIOUR

There is an increasing realization that a large proportion of the health status of individuals, families and communities has its roots in behavioural patterns. Such health-related behaviour has three distinct but overlapping facets:

- (a) To promote good health (e.g., breast-feeding);
- (b) To prevent ill health (e.g., hygiene, clean water);
- (c) To seek professional health care when self or family care no longer suffices.

Two currently important examples are described here. The first concerns breast-feeding, and the second deals with infertility, which is closely related to sexual behaviour, but also to the failure to seek and/or obtain health care.

Traditional patterns of breast-feeding, where almost all children are breast-fed at some time and most continue to be so fed for 18 months or more, are still usual in large parts of Africa, Asia and elsewhere. There has, however, been a decline, sometimes a very sharp decline, in specific population subgroups.

Women are abandoning breast-feeding, not necessarily from choice, but rather because they are forced by the circumstances of their lives to leave their babies for long periods of time. In addition, the work situations are often not conducive to breast-feeding; working hours are rigid and long, job security is uncertain, transportation/commuting is crowded and time-consuming. When the mother finally gets home, there is a full gamut of household work waiting for her: cooking, cleaning, fetching water and wood. This extra stress on women may be due to industrialization, to the employment of women outside of the family, to the breakdown of the supportive family structure or to any combination of these facts - in short, to socio-economic change. Where they are rich enough, as in some European countries, or when society is deliberately supportive, as in China, women are able to breast-feed despite these pressures. In many developing countries, however, poor women mainly in urban areas, in unsanitary conditions, with unclean water and insufficient money to buy enough breast-milk substitutes, are weaning their babies too early, often with disastrous results.

Breast-feeding is the natural and best foundation for infant health and nutrition - in any setting. Actions are needed to protect and support the practice. If nothing is done, the trend away from breast-feeding could continue and even more infants and young children will be placed at risk of diarrhoeal diseases, malnutrition and death.

It has long been known that lactation affects fertility and that prolonged lactation, in the absence of contraception, lengthens the inter-birth interval. Data from a WHO collaborative study make it possible to quantify some of the relationships between lactation and menstruation, pregnancy, the use of contraceptives and the incidence of conception prior to menstruation. A more precise understanding of these relationships can have considerable implications for policy formulation and can be used to predict, for example, the number of women in a given population who are "at risk" of becoming pregnant, the probable effect on the birth rate of a change in breast-feeding habits and the suitable time post-partum for family planning to be introduced. Hence, the health authorities have an important interest in

monitoring the prevalence and duration of breast-feeding, and to take and encourage appropriate action in support of breast-feeding if a reduction is anticipated.

Declines in breast-feeding have to be balanced by major increases in contraceptive usage if a rise in fertility is to be prevented, especially in countries where breast-feeding still has a major impact on fertility. In Bangladesh, for example, if breast-feeding patterns were to change to those typical of industrialized countries, the already high marital fertility rates would rise by over 50 per cent. For fertility to be kept at current levels in Bangladesh a more than five-fold increase in contraceptive use, from the present 9 per cent to about 52 per cent would be required.

If breast-feeding is to be encouraged and at the same time mothers are to be protected from closely spaced pregnancies, a number of problems need to be resolved. Chief of these is the choice of a suitable form of contraception for lactating women. A number of studies have shown that many lactating women are using oral contraceptives, despite the fact that there has been considerable concern about the effect of such contraceptives on the volume and composition of breast milk, on their possible transfer to the breast-fed infant and even on the possible future consequences of such a transfer. In contrast, injectable, hormonal contraceptives do not appear to have any deleterious effects on the quantity or nutritive value of breast milk, and the quantity of steroid received by the infant is considerably less than the amount of estrogen to which children fed with cow's milk are exposed.

The second topic dealt with here, involuntary infertility, is a condition which causes great personal distress and has important social implications. In most parts of the world 2-10 per cent of couples are affected, but in certain areas of Africa the percentage of infertile couples can be as high as 40 per cent. The infertile couple is subject to a variety of family and social pressures and conflicts. In those countries or segments of society in which the traditional emphasis of a woman's role is defined in terms of her fertility, involuntary infertility represents a social stigma, usually, not infrequently unfairly, borne by the woman. Failure to bear children is an accepted basis for divorce in many cultures. Coupled with high pregnancy wastage and infant mortality rates, high rates of infertility constitute a threat to the viability of some population groups.

In areas most seriously affected two main (sets of) causes have been identified: the consequences of post-partum and post-abortion sepsis affecting the woman, and the consequences of sexually transmitted diseases affecting either the man or the woman. The former is one of the more common non-fatal but nevertheless important results of inadequate health care before, during and after childbirth and points yet again to the urgency of increasing the coverage of health care.

POLICY AND PROGRAMME IMPLICATIONS

In the preceding sections, some of the currently important or emerging issues involving interactions between fertility, family and health have been briefly identified. Most of the issues selected for discussion are, if not global, at least of very wide scope, yet it should not be forgotten that the concrete situation in a given area or population always has some unique local particularities. For example, the biological risks of early teenage pregnancies are similar whether the woman is married (as in Bangladesh) or unmarried (as in Haiti). The social, and hence the health, implications of the risk will, however, be different in the two areas. In an analogous manner, the most feasible and effective approach to deal with the problems will always be that best adapted to the local circumstances. Nevertheless, it is possible to discern certain common or globally valid elements of effective policies and programmes.

The close interrelations between health and fertility were clearly recognized by all the signatories to the Declaration of Alma Ata (1978) which explicitly includes family planning as part of maternal and child health care and as an essential element of primary health care. Consequently, all countries are aiming to provide an integrated approach to maternal care and family planning. The Seventh General Programme of Work of WHO (1984-1989), which incorporates the various national and regional strategies to achieve "Health for All by the year 2000", has among its targets:

- (a) That at least two thirds of births are attended by trained health workers;
- (b) That appropriate training in maternal and child health and family planning is given to all health workers and to at least 70 per cent of those in other health-related sectors;
- (c) That at least 60 per cent of all couples of reproductive age can make use of services for birth spacing.

This integration of family planning with maternal and child health care corresponds to the existing realities in many, or most, countries, in the sense that the health care services provide family planning advice and service as a matter of course to their clients. The current weakness is the lack of population coverage of these services; in some areas less than 10 per cent of births are attended by trained health workers. The agreed approach to reach the targets is that of primary health care which is made operational in detail by each country for itself, but generally builds on self-care, community participation and intersectoral collaboration.

At the very heart of primary health care lies an idea that is not particularly new, but that has recently been applied with increasing effect to health care, namely the so-called "risk approach". This involves measuring the chances of future events, e.g., probabilities of health and disease, and organizing this information into a decision tool with which to improve priority setting and the effectiveness and efficiency of the health (and fertility) care system.

The commitment to making family planning universally available through maternal health care obviously does not in any way constitute a constraint to the intensification of the fertility regulation programmes to meet the specific demographic goals of its development plans and national population policies. Such programmes might include community-based distribution systems for contraceptives, promotional and educational activities through various sectors or directed at specific population groups such as the males or the adolescents. In many such situations, the health care system would be heavily involved, as principal actor or as the technical input. This active or supportive role in programmes which are not directly health programmes in the traditional sense, but which affect and interact with health, is a role that the health care system must be increasingly prepared to play in the years to come.

IV. POLICY IMPLICATIONS

A. Policy implications

Halvor Gille*

INTRODUCTION

The main purpose of the Expert Group Meeting was to prepare the ground for and make recommendations to the 1984 International Conference on Population in the area of fertility and the family. Important changes and developments have taken place in this area in most countries since the 1974 World Population Conference, and their policy implications should be considered. Some problems concerning fertility and family planning are now more acute and wide-spread than before, others declined in importance, while at the same time new issues arisen.

In considering policy implications, the views expressed and the recommendations made in the documents submitted to the Meeting and the discussion that followed should be taken fully into account, as well as the recommendations for priority areas for action identified in the review and appraisal of progress made in implementing the World Population Plan of Action, undertaken by the United Nations two and a half years ago. The recommendations of the review and appraisal, although generally overlooked in the discussion at the Meeting, have an important standing internationally. They have been adopted by the United Nations Economic and Social Council, which has urged all Governments, United Nations agencies and other intergovernmental organizations and non-governmental organizations concerned at the international and national levels to take them into account. As far as these recommendations go, it would be fairly safe to endorse them.

Mainly to be considered are policy implications that are operationally relevant and action that can realistically be implemented. Programmes have to be broadly conceived and be sensitive to national and local conditions. It has to be recognized that fertility determinants and their relative importance vary considerably from country to country and between regions and socio-economic groups within countries. It is, therefore, difficult and sometimes questionable to generalize about policy implications. Each situation is different and local conditions have to be considered and taken duly into account in drawing conclusions about the most appropriate policies and measures.

* Project Director, World Fertility Survey, International Statistical Institute, London.

POPULATION POLICIES

Governments should consider the implications of population trends for meeting their national development objectives and priorities and for enhancing the quality of life of their citizens. On the basis of such an examination, all Governments should be urged to establish a population policy. This recommendation goes further than the Plan of Action and the review and appraisal, both of which urged only that policies be established by those Governments that considered population trends a hindrance to development. All Governments should be urged to take a position on population policies. Even the adoption of a laissez-faire attitude should be a conscious policy decision, taken only after consideration of all socio-economic consequences of present and expected future population trends and the various policy options.

The World Population Plan of Action recognizes that a number of development goals have a moderating effect on fertility, either increasing or decreasing it. In view of the widespread concern of most developing countries about undesirably high levels of fertility and population growth, the main attention is given here to policy intervention which may reduce fertility.

FACTORS AFFECTING FERTILITY

Social and economic factors can have an influence upon fertility by affecting the demand for children, the supply of children and the costs of access to and use of fertility regulation.

On the demand side, the Expert Group Meeting considered mainly the fertility impact of development variables such as: (a) value of children, (b) economic costs of children and (c) child survival. On the supply side, attention was focussed mainly on age at marriage and infecundity due to breast-feeding. In the area of fertility regulation, the Meeting considered chiefly family planning. This grouping is not clear-cut and factors such as, for example, education, employment and residence may have an influence on fertility through several of the so-called proximate determinants.

VALUE OF CHILDREN

Children have an economic value for the family as providers of labour in times of need, particularly during the parents' old age. With economic and social development such as urbanization, improvement in education, industrialization and higher standards of living, the labour value of children decreases and with it the demand for children. Some policy measures can be taken to expedite this process. However, to restrict child labour through

legislation or to introduce compulsory education may not be effective unless the political, economic and social climate for such measures is generally favourable.

The value of child labour also declines if production functions are transferred from the family or household to market enterprise or co-operative establishments. Various institutional changes, provision of credit facilities and the strengthening of management should be promoted to accelerate this process.

The large majority of the adult population in developing countries, particularly in rural areas, have to rely on their children for support in old age and in times of need, such as during prolonged illness, invalidity and unemployment. Reliance on such support, which creates demand for children, can be reduced by promoting social welfare and social security schemes, co-operatives, mutual aid societies and employment guarantee schemes (as established in Maharashtra and Andhra Pradesh states in India). However, such institutions are not easily established in a subsistence economy; they are costly and take time to develop.

Costs of children

The costs of children include not only the direct costs of their food, clothing, education etc., but also the parents' indirect costs such as reducing their savings and investment opportunities, losing their employment and educational opportunities, or preventing the mother from undertaking income-generating activities.

It would hardly be acceptable to increase the direct costs of having children in support of a demographic policy. But opportunity costs may be increased by providing employment or income-generating activities for women outside the home and by facilitating their access to educational and vocational training programmes. In the conditions of severe unemployment or underemployment prevailing in many countries, emphasis should be given to training and production activities particularly in the informal sector and in small-scale enterprises. Such programmes should be designed mainly for unmarried and young married women with only a few children in order to have the desired result of delayed childbearing and reduced family size. These measures will at the same time promote generally development goals, in particular the integration of women in the development process and the improvement of their status in the family and in society. However, insofar as such employment and income-generating opportunities can be exercised in or near the home, they may lose some of their fertility-depressing effect by making children's participation possible and increasing the value of child labour.

IMPACT OF INFANT MORTALITY ON FERTILITY

Infant mortality may increase fertility in three ways:

(a) A biological effect through the discontinuation of breast-feeding, resulting in shortening of post-partum amenorrhoea, thereby increasing the probability of a new conception;

(b) A replacement effect whereby women consciously attempt to replace the deceased child;

(c) A protection effect by which women unconsciously have more children when they expect that one or more will not survive.

A strong biological effect is demonstrated in World Fertility Survey analyses by examining the length of the birth interval following a child's death. Among non-contracepting women in one country (Colombia) the death of an infant within the first six months accelerated the birth of another child by about 10 months, and in another country (Pakistan) the media birth interval was about seven to eight months shorter in cases when the birth beginning the interval resulted in a death within two months than when the child survived for at least one year, but in both cases the overall numerical impact on the national level of fertility was small.

Insofar as the replacement effect is concerned, WFS surveys are providing new and more substantial empirical evidence. Although estimates of the mortality effect on fertility vary considerably from country to country, the average effect is clearly much higher than previous studies indicated.

An international conference on infant mortality convened by the Committee for International Co-ordination in National Research in Demography in 1975 concluded on the basis of evidence available at the time that on the average one child death in the family led to far less than one-half of an additional birth in all the countries for which data were available. An analysis by the World Bank of more recent WFS data from 25 developing countries presented to the Expert Group showed considerable variation from country to country in the effect of infant mortality on fertility, but, overall, the effect was substantially higher, amounting to about half of a child more on the average than previously estimated. This analysis also indicated that a woman experiencing a child death had lower contraceptive use in all countries, and that the reduction was statistically significant in most of them (four out of five countries). By applying the findings to estimates of costs per birth averted through family planning, and costs per infant death prevented, it was found that even with the high estimates of the fertility effect of infant mortality, the most cost-effective way of reducing fertility would be through family planning rather than reducing infant mortality. Only in one country, Kenya, did the cost of preventing births appear to exceed the cost of reducing fertility through mortality reduction, particularly because the current low acceptance rates of family planning raised the cost per user to a very high

level, making mortality reduction the most cost-effective approach. When data from some West African countries become available, it is possible they may point to similar conclusions to those drawn for Kenya, because of the low demand for family planning and the prospects for low-cost measures to reduce mortality from its present high levels.

The protection effect, however, appeared not to be effective in a limited analysis undertaken of WFS data on desired family size and knowledge and availability of contraception in one country (Colombia). The desired family size did not appear to be correlated positively with infant and child mortality in various regions and environments.

It is interesting to note that whereas the Plan of Action in paragraph 32 includes reduction of infant and child mortality among the six socio-economic development goals that tend to moderate fertility, indeed it heads the list, the review and appraisal of the Plan made five years later omitted entirely the area of infant and child mortality, while maintaining the other goals more or less unchanged. In the light of recent studies infant and child mortality should clearly be included among the priority areas for action.

Vigorous measures should be recommended with the aim of reducing infant mortality, not only because of their direct impact on mortality, but also because of the moderating influence they may have on fertility. It is well known that reduction in infant mortality can be promoted through specific methods without waiting for a rise in levels of living and improved income distribution. More widespread health facilities, with the emphasis on primary health care reaching the population at large in their own communities, should play a major role as well as the promotion of the education of women, but measures to reduce mortality and health policies will be discussed by another group of experts to be convened by the United Nations later this year.

AGE AT MARRIAGE

Socio-economic development, particularly improvement in women's education, provision of increased employment opportunities for women and raising their status, can contribute to a higher age at marriage. WFS data show, however, that postponement of marriage by a few years in many developing societies where age at marriage is very low has little reducing effect on fertility and in some cases may even increase it, owing to reduced adolescent sub-fecundity and improved pregnancy outcome. It appears that in most countries only where age at marriage is raised substantially above the level of around age 21 is it associated with lower fertility. Even above that age the impact of a higher age at marriage is not always clear. Women who marry late tend to be better educated, have a higher social status, more often live in urban areas and practice contraception to a greater extent than women marrying younger. Their pattern of lower fertility may, therefore, be due to these factors rather than to their somewhat shorter period of exposure to risk of conception. The policy implication is that a substantial increase in age

at marriage is needed to, say, 25 years or more if this factor alone is to bring a significant reduction in achieved fertility, and it may not always be a determining factor.

A number of developing countries have tried to raise age at marriage through legislation alone, but often with little success. The administrative structure in many countries is too weak to enforce such legislation and until reasonably reliable registration of vital events has been developed, it will be difficult to implement it. Raising age at marriage by law is unlikely to be effective unless the social, economic and cultural climate is also changing and other factors reducing the level of fertility are in operation. Among socio-economic measures that contribute to postpone marriage as a determinant of fertility decline are education, vocational training, employment and other social and economic opportunities for women. To the extent that age at marriage is raised in this way, it may at the same time reinforce other social changes tending to reduce fertility, such as the transformation of the extended family pattern into a nuclear one, and the acceptance of full responsibility by parents for bringing up their own children.

BREAST-FEEDING

In countries where women breast-feed for long intervals, this practice acts as an important restraint on fertility. Analysis of WFS data shows that women in developing countries do not appear to use breast-feeding deliberately to space pregnancies. However, it has a substantial effect on birth spacing, adding on the average from 0.3 to 0.7 months to the length of birth intervals for every month of breast-feeding. These figures may be on the low side, influenced by use of supplementary foods side by side with breast-feeding. Other studies have shown that one month of breast-feeding lengthened birth intervals by three quarters of a month.

In Africa and Asia breast-feeding is nearly universal and the median length is between one and two years, but in Latin America around 80 per cent breast-feed for an average duration of less than a year. The practice of breast-feeding is on the decline in many developing countries as a result of urbanization, education and employment of women outside the home. At the same time, the same social changes increase use of contraception. The crucial question is whether increasing contraceptive use will at least neutralize the fertility-increasing impact of the decline in breast-feeding. In Bangladesh, the World Health Organization (WHO) has estimated that if breast-feeding patterns were to change to those typical in industrialized countries, the current high level of fertility would increase very substantially and a five-fold increase in the present low level of contraceptive use would be required to keep fertility from rising.

Policy-makers are faced here with a dilemma. Breast-feeding is declining under the influence of social change. For women to be integrated in the development process, to be employed and to participate in community

activities, they have to reduce breast-feeding. Furthermore, long durations of breast-feeding is a strain on their health, and supplementary food may have to be provided for the benefit of the child. Little is known about what measures will contribute to halting the declining practice in developing countries, except that information and communication activities may sometimes be effective. Therefore, to prevent an increase in fertility and to ensure proper birth spacing, a decline in the practice of breast-feeding has to be counteracted by stepped-up efforts to provide contraception, and moreover to provide it in a form that is most suitable and that will not interfere with the volume and nutritional value of breast milk. Still more could and should be done than at present to educate mothers about the nutritional value of nursing, and to facilitate whatever possible the maintenance of the current widespread breast-feeding practice. Thus, in many countries, maternity leave and benefits could be improved and legislation could be more effectively enforced to maintain prevailing breast-feeding patterns.

FAMILY PLANNING

Even in countries with a well-established family planning programme, a considerable unmet need for contraception exists, as established in a number of recent surveys. The desired family size declines with the spread of contraception. In communities where family planning services are easily available, use of contraceptives is generally higher than elsewhere.

Family planning programmes succeed in various settings only if they are introduced in a manner in accordance with the prevailing social and cultural values. A number of Governments are mainly or only interested in family planning in terms of its contribution to birth spacing. WFS data show that at least one third of couples use contraception for birth-spacing purposes. In WPPA, birth spacing is mentioned in only a few places (paras. 28 and 29a) and only in terms of the rights of couples to space their births. In many developing countries more attention should be given to birth spacing as a policy and programme objective.

The Plan of Action, as adopted nearly 10 years ago, is focusing much more on the role of various socio-economic measures than on family planning itself in furthering population policy objectives. In the area of family planning the main attention is given to information and education activities but even here there are some shortcomings. Thus, sex education and its importance for family planning and family life is not mentioned. Sex education should be introduced as early as possible, preferably before young people enter the reproductive age, and formal as well as informal educational channels should be used. Family planning education often reaches couples only after the wife has had several births, which may be too late if the emphasis is on birth spacing rather than on fertility control. Attention should be drawn to the need for well-designed communication programmes to influence the individual's perception of factors involved in decision-making, that is, not merely the content of decisions but also the process by which they are reached. Young

people's needs for family planning information and services should be specifically mentioned in the Plan. There should not be any doubts about their rights in this regard and this should be clearly stated, although some restrictions may be made concerning the types of contraceptive methods to be made available. It should also be made clear that unmarried couples as well as couples living in consensual unions should be provided with information and services to the same extent as married couples, to take into account the various customs prevailing or undergoing change in many countries. In view of the experience gained in a number of Asian countries, population and family planning education can be promoted effectively by utilizing the organization, outlets and workers of other social programmes such as agricultural extension, trade unions, co-operatives, women's organizations and community development projects.

Family planning programmes should engage the communities concerned more fully in all aspects of the planning and execution of the programmes. This is necessary to promote the understanding and enlist the participation of all couples to enable them to realize fully their own needs and priorities and to further national goals. Existing community groups including voluntary organizations should be fully involved in programmes, and the planning, management and allocations of resources should be delegated to them as far as possible.

Prevailing social, cultural and economic restrictions in many societies undermine the status of women and prevent them from participating in family planning and other development programmes. It is suggested that the following recommendations made at the International Conference on Family Planning in the 1980s be endorsed:

(a) To promote improvements in the status of women by seeking changes in laws, customs and practices that discriminate against them;

(b) To assist women to improve their lives by supporting special women's development programmes in education, health nutrition, income generation, and other areas;

(c) To design family planning services to address inequities between men and women by greatly increasing the participation of women not only in provision of services, but also in management, policy-making, and programme design.

With expanding family planning services, maintaining an adequate supply of contraceptives is an increasingly serious problem in many countries, considering the amount needed and the sensitivity of some sectors of the population. Most programmes rely heavily on supplies provided from subsidies from Governments or international agencies. Future needs should be assessed and ways and means of meeting them should be planned. Self-reliance in developing countries with regard to the supply of contraceptives should be promoted as far as possible, and local manufacturing and packing should be encouraged and explored. Regional or sub-regional co-operation and other ways of making joint efforts may in some cases be the solution.

All contraceptive methods should be made available in programmes insofar as their use is legal and in accordance with prevailing social values. In this connection it is pertinent to recall the concluding remarks made by the Deputy Secretary-General for the Conference, Mr. Tabah, to the Expert Group Meeting to the effect that, "the issue of abortion, however controversial, was one that must be addressed. It was an issue that continued to stir the conscience of people everywhere. Women feared it, but underwent it nevertheless. It must be dealt with objectively and intelligently, for it was a method used by women since time immemorial and until this day. He concluded that it must not be totally overlooked at the Meeting.

Unfortunately, the Expert Group Meeting did not follow this request. Abortion nevertheless cannot be ignored as a family planning method. A large number of abortions take place (WHO estimates the annual number to be between 30 and 55 million, about half of them illegal, and more than half in developing countries). Well over two thirds of mankind and around 72 per cent live in societies where access to this method is available to all or permitted on socio-economic and health grounds. Only 9 per cent live in countries prohibiting abortion altogether, and 19 per cent in countries permitting abortions to save the life of the woman.

We should recommend that all methods of family planning that are legal shall be made available to the population at large including the so-called natural methods of family planning. Provisions should be made to include all such methods in information, education and service programmes to ensure the individual's free choice and to strengthen the acceptability and practice of family planning.

Requirements for formulation and implementation of policies

At the governmental level it is essential that a clear political commitment should be made to support family planning and population policies and that the necessary administrative support should be provided. All government agencies concerned with socio-economic programmes for the benefit of the family and the community should be involved in the planning and implementation of family planning activities in a co-ordinated way. The importance of more efficient management of programmes is often ignored.

In countries fully committed to promote family planning and the implementation of programmes designed to reduce fertility, a shortage of financial resources seems not to be the most serious constraint. Allocations at the national level have been growing steadily in these countries, but to implement programmes effectively, considerably more resources are required. At the international level, however, a shortage of funds has developed recently, limiting technical assistance and other types of external support required by developing countries.

The choice of policy options and the formulation and implementation of policies and programmes are often limited by lack of data and knowledge of what would be the most effective action to take. WFS surveys have clearly demonstrated the usefulness of fertility data for political leaders, planners, implementing governmental and non-governmental agencies, research workers, teachers etc. The documentation for this meeting and the ensuing discussion would have been quite different, and indeed very limited, if it had not had access to the rich source of information from fertility surveys in a large number of countries. There is a need for continued study of fertility determinants and patterns and for monitoring trends. A number of countries that have not yet participated in WFS are now showing interest in carrying out a survey, and several countries that participated in the first round now want to carry out a second round. In the best interests of sound policy-making and programme development, it will be necessary to assist many developing countries in the future in collecting data at the aggregate community and family levels to meet the need. The capacity of countries to analyse, interpret and apply data also needs to be strengthened.

The World Population Plan of Action provides a long list of areas requiring research. Unfortunately, this list is almost all-inclusive and indicates no priorities. The review and appraisal report only passes along the responsibility, as it were, by urging Governments to set priorities for research. The Plan should be more specific with regards to the areas of research that are most important and urgently needed as guidance for future policy-making and action. The discussion at the Expert Group Meeting brought out some of these areas.

Future research efforts should be more problem-oriented and consider the various socio-economic settings in which programmes are to be developed. More needs to be known about how to prepare strategies in various local situations which will help people to make decisions and to participate in the implementation. The functions and roles of both women and men in family building, domestic life, economic activity, social and cultural organizations and in the community, as well as the dynamic interaction between them, need to be better understood and the subject of further research. The changing roles and relationships of family members and the importance of different family systems have to be taken fully into account in developing population and employment policies. The characteristics of the community, its functions, economic and social structure, political organization and the facilities and services it provides are all factors in determinants of fertility and decision-making which should be studied as guidance for action.

Human reproduction and family planning is a particularly important area of research. We should endorse the call made in the International Development Strategy for the Third United Nations Development Decade for increased biomedical and social research into safe, more efficient and more widely accepted techniques of fertility regulation. Research should be promoted with the aim not only of developing new methods but also of making existing technology more effective and acceptable.

A serious problem facing family planning workers is the side effects of some contraceptive methods which often result in high discontinuation rates. In one WFS survey (Philippines), side effects was the reason given by one third of all women for discontinuation, and it was estimated that if a contraceptive method free from side effects and fully effective had been available, discontinuation rates could have been cut by over one half and the birth rate reduced by some 5 points per 1,000 population. Despite the clear needs for increased research on human reproduction and family planning, the amount of funds has decreased in real terms in recent years.

As clearly revealed by the discussion at the Meeting, another area of much needed research is family planning incentives and disincentives. A comprehensive study including carefully designed and evaluated pilot schemes should be undertaken with the view to assessing the experience gained with various schemes initiated in different socio-economic cultural and political settings, as well as their cost-effectiveness and demographic and other impact.

TARGETS

The Plan of Action refrains from setting global or regional targets relating to fertility; it urges countries who have a policy to set their own targets. It would be difficult and hardly very effective for the international community to establish demographic targets in the field of fertility. Countries should themselves set targets, but in setting targets on fertility, countries should make them realistic and attainable, taking fully into account the demographic, social and economic implications, including changes, if any, in the age structure and the patterns and levels of development.

While global or regional demographic targets on fertility may not be useful, serious consideration should be given to establishing certain operational targets which policy-makers in all countries should relate to action and have as goals. The work programme of WHO established for the 1980s illustrates the kinds of targets that may be considered for adoption:

(a) At least two thirds of all births should be attended by trained health workers;

(b) Training in maternal and child health care and family planning should be given to all health workers, and to at least 70 per cent of those in other health-related sectors;

(c) At least 60 per cent of all couples of reproductive age should be given access to birth-spacing services.

Another possibility is to establish targets for meeting a certain clearly defined part of the unmet need for family planning. In any case the Declaration of Alma Ata 1/ about providing primary health care, including family planning for all by the year 2000, is a target which should be endorsed, although it is quite vague and requires clarification to become operational.

Note

1/ Primary Health Care: Report of the International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978. (Geneva, World Health Organization, 1978), pp. 2-6.

B. Measuring the impact of population policies and programmes on fertility

W. Parker Mauldin*

INTRODUCTION

The more and less developed countries have been on opposite growth trajectories during the past three decades. Around 1950, developed countries increased by about 10 million persons per year, and at an annual rate of slightly more than 1.25 per cent. Today, the annual increase is about 8 million per year, and the rate of increase is only 0.7 per cent. In developing countries the annual increase was about 35 million per year at the beginning of the 1950s and is now about double that. The rate of increase was just under 2 per cent during the early 1950s, increased to almost 2.4 per cent per year, after which decreases in fertility lowered the annual rate of increase to about the same level as it was 30 years ago.

In developing countries there was a relatively short time lag between the increased rates of population growth during the 1950s and the adoption of population policies and the implementation of family planning programmes. The population of the less developed countries (LDCs) increased by almost one fourth during the 1950s, and by more than one half from 1950 to 1970. By the end of the 1960s a substantial number of Governments had adopted policies designed to reduce rates of growth. Today, 35 countries with more than 75 per cent of the population of all developing countries have official policies to reduce the rate of population growth, and an additional 31 countries support family planning programmes for other than demographic reasons. Approximately an equal number of countries - 65 - do not support family planning programmes, but their combined population number fewer than 250 million, less than 10 per cent of the population of developing countries. Opinions in the academic community about the relationship between population growth and economic development cover the spectrum, from the view that population growth is a needed stimulus to economic development to the view that rapid population growth is a serious deterrent to economic development. But economists and policy-makers in planning commissions in countries with the bulk of the world's population have concluded that economic development policies and programmes need to be supplemented by population programmes that contribute to a reduction in the rate of population growth.

The decision of policy-makers in many developing countries that deliberate efforts to reduce rates of population growth are likely to be effective, and that reduced rates of population growth will contribute to economic development has led to the growth of a "population industry". Donors contribute about \$ 500 million yearly to population activities, and the

* Senior Scientist, The Rockefeller Foundation, New York.

Governments of developing countries contribute appreciably more. These efforts represent but a small fraction of the funds devoted to economic, development, but they are of substantial magnitude. Programmes administrators, policy-makers and donors share a common interest in what the important elements are in an effective population programme, what the effect of the various programmes have been, and how they can be improved.

In the more developed countries, fertility fell rapidly during the last two or three decades and is below the replacement level in a number of countries. Several of these countries have developed policies and implemented programmes designed to increase fertility to replacement levels or slightly above. There were roughly similar efforts during the 1930s in Germany, and those efforts were judged to be ineffective. Programmes to increase fertility, particularly in the East-European countries during the late 1960s and 1970s, are more sophisticated, more costly and more promising.

This paper discusses the nature of population policies and programmes, how to measure the inputs of different programmes, and what their impact has been on the reduction of fertility.

POPULATION POLICY

The International Union for the Scientific Study of Population, in its Multilingual Demographic Dictionary, states that population policy "deals with measures designed to influence population changes" (1982, p. 17). This is sometimes characterized as a narrow definition of population policy. A broad definition of policy would include not only policies designed to influence demographic behaviour, but also policies that actually do influence demographic events.

Corsa and Oakley (1979) reviewed the definitions of 34 writings spanning the period 1940-1975 and concluded that despite considerable differences in definitions, the key elements on which there is agreement are:

- (a) Some demographic effect should be intended or produced;
- (b) The Government participates, in some way;
- (c) Indirect as well as direct means of sub-policies are included;
- (d) The term population policy generally refers to population influencing, rather than to population-responsive policies.

The emphasis in most cases is on natality and internal population distribution. Mortality is, if mentioned at all, never considered the central focus of a population policy.

Their definition is as follows:

"Government population policies are those actions of government that affect or attempt to affect the balance between births, deaths, and migration of human beings".

Corsa and Oakley also examined a large number of policy statements by countries and tabulated the policy content of those statements; these are summarized in table 1.

Table 1. Summary of plans and statements of measures intended for reduction of population growth for 22 countries, 1952-1971

Measure	Number of documents with mention for purpose of reducing population growth
Family planning services	33
Structure of government benefits, antinatalist	3
Age at marriage	5
Laws	
Liberalization of abortion	5
Legalization of teaching, importation or distribution of contraceptives	2
Divorce	1
Employment of women	4
Health care (other than family planning)	1
Family planning, sex or population education	8
Research	5
Government office to deal specifically with population	3

Note: Where available and relevant, more than one statement is used for a country. General development plans as well as specific population statements are included.

Sources: Government documents: Nortman, 1975; United Nations, Department of Economic and Social Affairs, 1970 and 1972a.

Among the 34 definitions examined, there was a sharp division of opinion on the category of intent. Twenty statements contained definitions that would include both explicit and implicit population policies. Thirteen writers said that only explicit, international policies could be defined as population policies; however, five of those made statements later indicating that in some instances they would also include implicit intentions. It is clear from table 1 that some of the measures taken might be included as explicit population policies in a given country, and a similar law, e.g., liberalization of abortion, could exist in another country without being linked to population policy. The effect of the laws themselves would be roughly comparable, but in one instance one has an explicit policy and, in the other, a policy that seems to be divorced from the population policy. In any analysis of the effects of a wide variety of policies that affect population, one would wish to treat these two situations identically.

Although the development of family planning programmes is the primary policy instrument used by Governments seeking to reduce rates of population growth, there are a variety of other measures that could be taken to influence fertility, including incentive programmes, tax and welfare benefits and penalties, shifts in social and economic institutions, e.g., an increase in minimum age at marriage through legislation, persuasion or through substantial fees for marriage licenses; intensified educational campaigns, and even at the extreme, the establishment of involuntary fertility control. There have been a number of experiments using incentive and disincentive programmes, and a number of countries have attempted to influence the age at marriage and to impose various tax and welfare benefits and penalties, such as:

- (a) Withdrawal of maternity benefits after N children;
- (b) Withdrawal of children or family allowances after N children;
- (c) No tax benefits for children after the Nth child etc.

Pronatalist policies are almost the reverse of the above list; that is, they provide maternity benefits, which often increase as the number of children increases; housing loans, which are reduced as the number of children born to the couple increases; family allowances etc.

Developed countries

In 1980, 8 out of 39 developed countries considered their fertility level to be too low, 31 considered it satisfactory, and no country regarded it as too high (United Nations, 1982, p. 39). Each of the developed countries that considered fertility rates to be too low, with the exception of the Federal Republic of Germany, had adopted a series of measures to increase fertility. In addition, 10 developed countries that considered their fertility rates to be satisfactory used incentives and disincentives to maintain those rates.

Typical incentives included paid maternity leave, child allowances, marriage grants, subsidized creches and kindergartens, housing subsidies, educational subsidies and income tax systems differentiated by the number of dependents.

Many of these benefits are provided by Governments that consider it inappropriate to intervene in fertility with incentives; their rationales for such benefits are to assist mothers in the last stages of pregnancy and the early phases of child-rearing, to moderate income differentials between larger and smaller families and to generate favourable conditions for the upbringing of children. For example, the Governments of Austria, the Netherlands and Sweden explicitly state that they perceive the present level of fertility as satisfactory and consider it inappropriate to intervene in fertility behaviour, but they provide comparatively generous maternity benefits and child support measures (Frejka, 1982). Frejka also notes that "in almost every European country, East and West, South and North, a couple or a single mother receives a grant at the time a child is born. The mother has the right to a virtually full-paid maternity leave of at least 10, possibly up to 33 weeks. The family automatically receives periodic child allowances".

The centrally planned countries of Europe are generally regarded as being pronatalist, and Wynnyczuk (1981) so classifies them, but he notes that only Romania has officially adopted numerical demographic objectives. He adds that "... although they are oriented to the raising of birth rates, (they) follow at the same time broader aims, namely the care for the healthy, qualitative development of the population as a whole. This qualitative aspect includes, for example, the effort for the elimination of pregnancies at risk, for the lowering of infant and child mortality, medical treatment of infertility, extension of the expectation of life, increase of the stability of the family, improvement of health and of social welfare of the whole population. These broader aspects cannot be taken as isolated because of the comprehensive influences of individual factors upon such a complicated phenomenon as fertility development in our time" (p. 360). A capsule summary of measures offered in several countries is given in table 2.

There have been some shifts in perception of Governments of the acceptability of current fertility levels and the desirability of intervening to change it. For example, in 1978 (United Nations 1980) Czechoslovakia and Poland considered their fertility rates as satisfactory and incentives were implemented to maintain the rate. In 1980 (United Nations 1982) the rates were considered to be satisfactory but interventions were not appropriate. By 1982 the position of both Governments had shifted back to the same position as in 1978. Belgium considered its rate of fertility to be satisfactory during the periods under discussion, and in 1978 it thought that interventions were not appropriate, but in 1980 and again in 1982 it replied that interventions to maintain the fertility rate were appropriate. Sweden shifted from feeling that its fertility rate was satisfactory (United Nations 1980, 1982) to the view in 1982 that fertility was too low. Interventions were not considered appropriate at either of these time periods.

Table 2. Summary of demographic measures in five centrally planned countries

Country	Major policy measure(s)	Impact
Romania	Withdrawal in 1966 of legal, induced abortion, the central instrument of fertility control, and discouragement of other modern means. Various maternity and family allowances including 94 per cent of monthly wages for third higher order births when not working regardless of length of uninterrupted service; monthly allowances of 6-10 per cent for the first child rising to 8-12 per cent for the third child for low income families.	Immediate sharp increase in fertility, then slow decline over five years to the current level, still about 5 points or 35 per cent above 1966. A comparative calculation concludes that about half the increase in Romania's population in the 1966-76 decade was attributable to the no-abortion decree, or with extrapolation that it may amount to about the size of the USA baby boom. The decree seems to be realizing Romania's goals of a CBR of 18-19 and a population of 25 million by 1990. The study concludes: "The final irony is that the very country whose capital is symbolic of or virtually synonymous with, the relative put-down of family planning at the World Population Conference of 1974 was at that very time realizing the remarkable consequences of its own family planning intervention, which today constitutes one of the world's major examples, beneficiaries, and successes" (Berelson, 1979).
Bulgaria, Czechoslovakia, Hungary	Family allowances, maternity and/or birth payments graduated by birth order for 3-5 per cent of average annual wage for the first child to about 40 per cent for the third child to 45-70 per cent for the fifth.	Degree to which second and third order births were stimulated is unclear as yet. A specialist concludes: "Institution of fertility-supporting cash incentive programs may predominantly influence the timing and spacing of births. But changes in the timing of births will inevitably have long-term effects on population growth rates. Permanent effects on population size at any given future time, and--at least in the case of influences which advance the date of the first birth--probable effects on levels of completed fertility...". It is however, too early to offer an empirical conclusion, despite the existence of some positive natality signs in each of the three countries. The "positive pronatalist programs appear to have been somewhat successful but at a very high budgetary cost" (McIntyre, 1976).
Democratic Republic of East Germany	Many benefits, including 1000 marks per child + 20 marks/month for first and second children, increasing to 70 marks for fifth and higher orders. For low income couples, an interest-free loan of up to 5000 marks for household furnishings: 20 per cent of this is cancelled at birth of first child, 30 per cent for the second, and the remaining 50 per cent for the third child, if born within 8 years. Also, an interest-free loan of up to 5000 marks for modernization of a flat. (Similar low-interest loans partly cancelled with increased number of children and substantial rent subsidies tied to births in Czechoslovakia and Hungary.)	The government reports that the effects of measures implemented during 1972-75 have been measurable since early 1977--an increase from 1975 to 1977 of 26 per cent in second births and around a 20 per cent increase in third births.

Source: W. P. Mauldin and Berelson, "Conditions of fertility decline in developing countries, 1965-75", Studies in Family Planning, vol. 9, No. 5 (May 1978), pp. 89-148.

Thus, developed countries may be divided into two groups, those that consider their fertility rates too low, and those that consider them satisfactory. Each of these groups can be divided into those that consider interventions appropriate, and those that consider interventions as not appropriate. Each of these groups could, in theory, have explicit demographic objectives but in fact very few do so. Within each of these groups, family welfare measures have been adopted and implemented, sometimes with a demographic objective, but more often not. Under these circumstances it is very difficult to assess the impact of measures designed to increase or to maintain fertility rates. Pressat (1979) concludes that effects of pronatalist measures in Eastern Europe seem to be transitory and reflect mainly earlier but not more births to parents. Frejka (1980) has argued that pronatalist policy measures were at least in part instrumental in halting the fertility decline experienced in the 1950s and the 1960s in Eastern Europe and that the measures helped to maintain fertility around replacement level in the 1970s.

Developing countries

In 1980, almost half the developing countries, 59 out of 126, replied to the United Nations inquiry (United Nations, 1982) that they wanted to have a lower fertility rate. About the same proportions, 53 countries, stated that they were satisfied with the existing level; and only 14 countries (11 per cent) wanted a higher fertility rate. Among the countries that wanted lower fertility, 21 replied that interventions to affect the fertility rate were not appropriate, whereas 38 said that interventions were appropriate and were being implemented. Similarly, among those countries that felt their fertility rates were satisfactory, 32 said that interventions to maintain the rates were not appropriate, but 21 countries stated that interventions to maintain the rate were appropriate. Among countries desiring higher fertility rates, 10 replied that interventions were appropriate, and only 4 said that interventions were not appropriate.

The perceptions of Governments about fertility rates change over time. The change in perceptions is sometimes the result of changes in the demographic situation, as in Colombia where fertility rates have declined in recent years. In other instances, the change may be the result of a less favourable social and economic development than previously envisaged. Table 3 summarizes changes in the perceptions of Governments about fertility from 1980 to 1982, for selected countries, based on preliminary tabulations from the 1983 Monitoring Report of the United Nations.

Legal measures. A number of legal measures may affect fertility, whether or not they are adopted for that purpose. Examples include laws and regulations relating to access to different methods of contraception, sterilization and abortion, minimum legal age of marriage, and prohibition of polygamy.

In 1980, 80 of 126 developing countries said that they provided direct support for modern methods of contraception, and an additional 14 said they provided indirect support. Twenty-three countries said they did not provide support for contraceptive methods, but that access to contraception was not limited. Only nine developing countries said that access to contraception was limited. These figures overstate the extent to which contraception is available at reasonable cost and convenience to the general population, according to many knowledgeable observers. There is only limited objective evidence regarding the extent of availability of contraceptive methods, although contraceptive prevalence surveys increasingly are collecting information on the perception of clients as to the availability of contraceptive methods.

Table 3. Changes in Governments' perceptions and policies with respect to the current fertility level, 1980-1982

1980	Rates too high		Rates satisfactory	
	Intervention O K.	No inter- vention	Intervention O K.	No inter- vention
<u>Rates too high</u>				
	<u>Intervention O K</u>	Papua New Guinea Swaziland	Colombia	Costa Rica El Salvador Iran
	<u>Intervention not appropri- ate</u>	Algeria Dominican Republic Rwanda Senegal Zimbabwe		Guatemala Jordan
<u>Rates satisfactory</u>				
	<u>Intervention O K</u>	Malaysia		Mozambique Yemen
	<u>Intervention not appropri- ate</u>	Burundi Gambia Honduras	Ethiopia United Rep.of Tanzania	

Paradoxically, though the number of couples sterilized has grown so rapidly that it is probable that more couples are protected by this than by any single reversible method, sterilization remains illegal in many countries. Forty-one countries replied that sterilization was illegal, 60 stated that sterilization was legal or that laws did not clearly define whether or not sterilization was legal or illegal, and 25 countries did not provide information. Thirty-eight countries permitted sterilization on request, or for socio-economic reasons or for birth control. In China and India, as well as in the United States of America, three of the most populous nations of the world, there is a high prevalence of sterilization.

Abortion on request or that is justified on socio-economic grounds was permitted in only a few developing countries, as of 1980. Only five permitted abortion on request, and an additional eight countries permitted abortion for socio-economic reasons. An additional 46 countries permitted abortion where there was risk to the health of the mother. Reported legal abortions in less developed countries are quite small in number except in a few countries and areas, e.g., Cuba, Hong Kong, Singapore and Tunisia. China does not regularly report the number of abortions, although the Minister of Health stated in 1980 that more than 20 million abortions are performed every year.^{1/}

The extent to which abortions are practiced without legal sanction is a matter of speculation. Sample surveys are known to give gross underestimates of the number of abortions, although use of the Randomized Response Technique shows for Taiwan, Province of China and Turkey that the percentage of women ever having an abortion to be about twice the rate determined through direct questioning.^{2/} Another technique tried in Seoul, Republic of Korea, was to interview staff at hospitals, and physicians, particularly those thought to perform abortions. Data from this source produced an estimate of the number of abortions that was 3.7 times higher than the number estimated from a sample survey with direct questioning of respondents.^{3/}

Relatively few surveys have been undertaken using the Randomized Response Technique. Similarly, there are very few surveys that have interviewed physicians and other persons who perform abortions. There are many guess-estimates of the number of abortions, but these are of unknown reliability and validity. For example, in 1970, prior to the legalization of abortion in India, the International Planned Parenthood Federation estimated that there were 6.4 million illegal abortions.^{4/} Since legalization of abortion in 1971, the reported number of legal abortions (called "medical terminations of pregnancy") has been quite modest, gradually rising to 385,700 in 1981 (Tietze, 1983). There is no evidence to suggest that the number of abortions in India has decreased, but a figure of 6 million or so cannot be justified on statistical grounds; rather, it is based on estimates made by knowledgeable people. Its significance is that persons familiar with India believe that abortion is widely practiced.

There is strong evidence for several countries that the number of illegal abortions is substantial, and there is suggestive evidence that this is true in many other countries where abortion is illegal. Thus there is ample

evidence that many women want abortions even in countries where they are illegal. The extent to which legal sanctions act as a barrier to practice is not known, but it is the author's view that the number of abortions would increase substantially if abortions were legalized, and if facilities were readily available at low cost.

Economic incentives and disincentives. Economic incentives have been given to family planning workers, to communities and to individuals and couples. There has been some discussion in the literature about what is a fair and equitable incentive as compared with an incentive that is sufficiently large that it may be considered as a bribe, or that may border on coercion. For example, payment to a poor client to cover the costs of transportation and time lost from work would be considered by many to be a justifiable minor incentive. If, however, the amount of the incentive were to approach the equivalent of a week's or a month's wages, some would consider that as too much of a temptation for a poor labourer. It is important to keep in mind what is an appropriate incentive. In practice, however, incentives to clients and communities have had rather limited use. Incentives to family planning workers have been used frequently.

Although incentives to clients and to communities have had only limited use, there is growing interest in their use, and increasing experimentation with incentives among various groups (People, 9/4, 1982). The most widely used measure is cash payments to sterilization acceptors, and frequently these payments are described as a reimbursement of expenses involved in having the operation - transportation, loss of wages and other costs. In Bangladesh, for example, a new sari is given to female sterilization acceptors, to help prevent infection. In the Republic of Korea the Government has announced an additional incentive for families holding a "green card", that is, a family officially classified as needy. If either spouse under the age of 40 undergoes sterilization, the family will be awarded 100,000 won (\$ 140) if they have no more than two children, or 30,000 won (\$ 42) if they already have three or four children. China, the Republic of Korea and Singapore have schemes for adjusting priority allocations for medical care, education, employment and housing. Most of the incentive schemes are of such recent origin that evaluation of their impacts have not been made. An exception to this is the count of sterilization acceptors before and after special incentive schemes have been introduced. There is evidence from several countries that incentives to clients for sterilization appreciably increases the number of sterilization acceptors.

Measuring the impact on fertility of policies and programmes

The determinants of fertility are complex. In a recent publication the National Academy of Science stated that fertility is "affected by cultural preferences of diverse roots and strengths, family structures that distribute power over fertility decisions in different ways, customs and taboos relating to sexual behaviour, childbirth, and child-rearing, varying and rapidly

changing economic conditions, and, in many countries, an increasing amount of government concern and activism" (National Academy of Sciences, 1983, part A, p.1).

One framework for the analysis of fertility (Easterlin, 1975, 1978; National Academy of Sciences, 1983) classifies the basic components of fertility determinants under the headings of supply of children, demand for children and fertility regulation. The supply of children is the number of surviving children a couple would have if they made no deliberate attempt at limitation: an alternate term for supply might be the "biocultural potential for surviving children". Five major influences on natural fertility can be identified (Bongaarts and Menken, 1983): (a) post-partum infecundability, (b) the waiting time to conception, (c) intrauterine mortality, (d) permanent sterility, and (e) entry into the reproductive span. The effects of these intermediate or proximate variables can be estimated, but their determinants, whether health- and nutrition-related, socio-cultural or economic, are less well known.

The demand for children refers to the number of children that a couple, or a woman, desires. Demand can be seen as determined by the interplay between tastes for children and constraints on the couple, apart from the constraints of supply and fertility regulation costs. A couple is assumed to have some preferences between children and other goods, and these preferences are called "tastes". They are constrained by the resources available to them, combined with relative prices and time-intensities of children and other goods.

Fertility regulation covers the means that couples use to control the timing and number of births. However, fertility regulation also involves costs the couple must consider in weighing their choices. Thus regulation enters the framework in two ways: as the means for effecting choices and as a factor in choice. Fertility regulation involves some effort, occasionally some inconvenience, embarrassment or guilt, often some monetary cost; the generic term costs is used to cover all of these. Fertility regulation may also have some benefits apart from that of avoiding a birth or achieving a smaller family. These may include protection from maternal mortality risks, unfavourable side effects of contraception, or, in some groups, conformity with social norms.

The determinants of the basic components include all the variables used in empirical analyses of fertility, such as education, female employment, urban versus rural residence, income, the health and nutrition status of husband and wife, their religion, their ethnicity, their exposure to mass media etc. In addition, institutional factors are important determinants of fertility (McNicoll, 1980; Potter, 1983). Institutions of consequence in this connection range from such concrete entities as schools, churches, and local welfare systems to less tangible aspects of economic, social and administrative organization. We do not, however, have adequate ways of measuring the impact of institutional factors on fertility.

Given the complexity of the determinants of fertility, it is not surprising that measuring the impact of population policies and programmes is not an easy or straightforward task. Relatively little effort has been devoted to measuring the impact of legal measures and of incentives and disincentives. Rather more effort has been expended in attempting to measure the impact of policies and family planning programmes, and the pages that follow will, therefore, concentrate on the latter.

FAMILY PLANNING PROGRAMMES

The rapid increase has been noted in family planning programmes supported by Governments during the past two decades, and the growth in funding from almost nothing two decades ago to \$ 500 million from donors and perhaps double this amount from LDCs. The annual number of family planning acceptors in large-scale programmes increased from a few tens of thousands around 1960 to about 2.5 million in 1965, and to approximately 25 million in 1980, excluding China for which quantitative data are less readily available. Estimates of prevalence of use are now available from the World Fertility Surveys, contraceptive prevalence surveys by Westinghouse and the Centers of Disease Control, plus national surveys in a few countries. These data demonstrate the very rapid increases in contraceptive prevalence in some countries with national family planning programmes (see figure I). These increases are much more rapid than are changes in socio-economic variables.

In some countries, however, contraceptive prevalence rates remain low after many years of a national family planning programme -- Bangladesh, Ghana, Kenya, Morocco, Nepal and Pakistan, for example. Although trend data are not available for most countries with national programmes, prevalence rates are available for a relatively recent year, e.g., 1975 or later (Larson, 1981).

Programme inputs. One would expect, a priori, that a well-organized family planning programme that is readily available to a large proportion of the population would be more effective than a poorly organized programme that is limited in its coverage. This suggests that a good measure of programme quantity and quality is needed, that is, a measure of the most important indicators of a high quality programme. Unfortunately, there have been but few efforts to quantify programme inputs (Lapham and Mauldin, 1972; Mauldin and Berelson, 1978; Faruquee, 1979; King, 1974; Srikantan, 1977), and most analyses use very crude measures, or simply treat programme inputs as a 0/1 variable.

A family planning programme seeks to provide information about the means of fertility control (what are the different methods, how do they work, what are their advantages and disadvantages, how to use them and what they cost) and where and when services are provided. Information programmes also frequently address such issues as the possibility and desirability of regulating fertility, the reasons for national fertility goals and approaches to spacing children. Key elements of a good delivery system include the

availability of a wide range of fertility control methods, convenience, high quality service, reasonable anonymity (where necessary, depending on local circumstances) and low cost. Information about the advantages and disadvantages of various methods should be readily available. A medical referral system should be provided to diagnose and treat complications arising, or thought to arise, from use of different methods of fertility control. A resupply system should not require identification of the individual for methods that do not need the attention of personnel for medical reasons, however useful such information might be for administrative and evaluation purposes. This is because a system that requires identification of individuals tends to increase waiting time and destroy anonymity. Methods requiring the attention of medical personnel, however, also require the keeping of individual records.

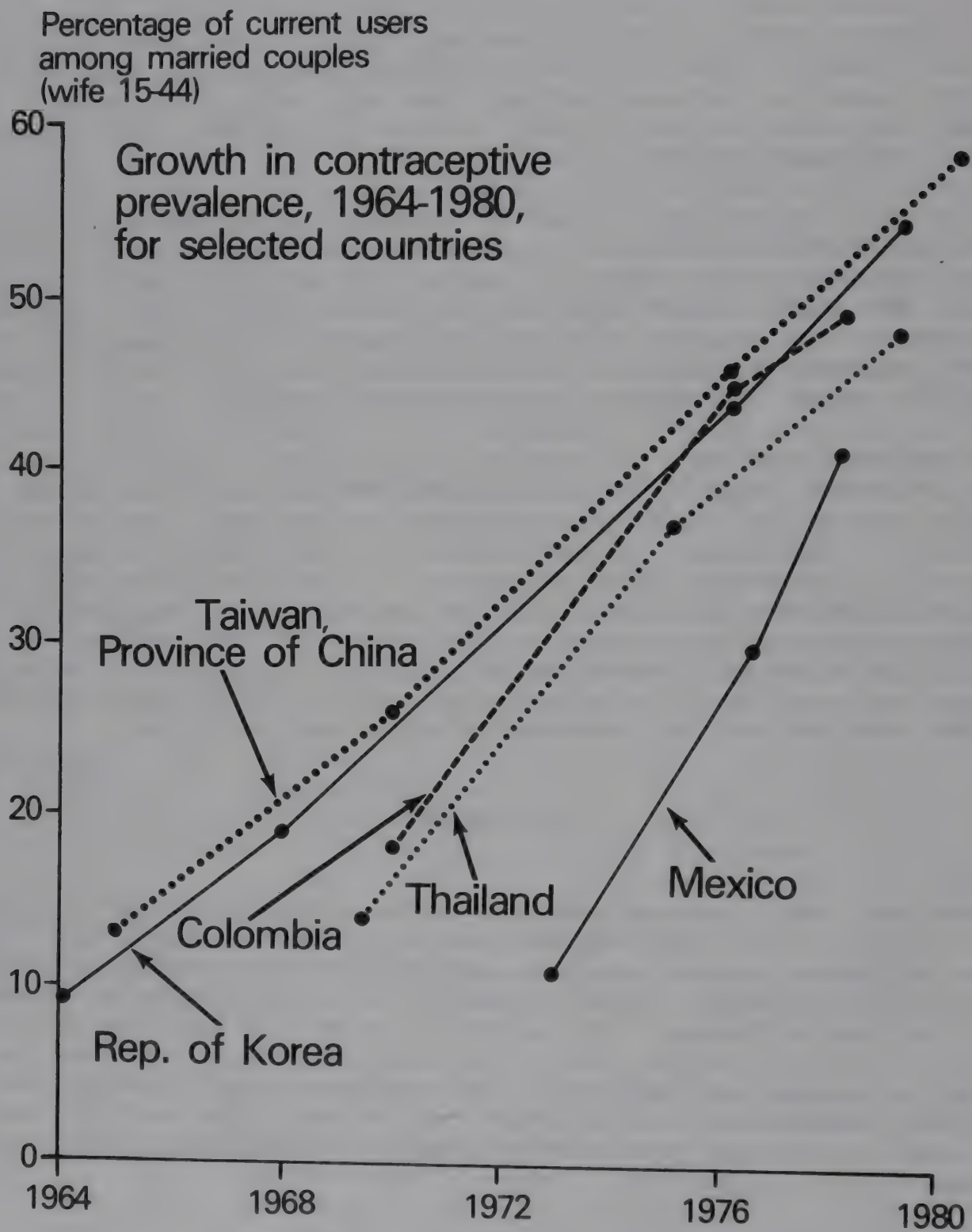
This brief description of some of the principal components of a family planning programme suggests that a programme administrator has need of many kinds of information in order to assess how well or poorly the various components are being carried out, and how effective they are. Evaluation of those components is important for the development of a strong and effective programme; however, this paper is concerned with the effect of such programmes on fertility, which is considered as a dependent variable.

The existing measures of programme effort recognized as crude and in need of much refinement suggest that in a given setting programme inputs can be relatively strong or weak, comprehensive or minimal, widely or rarely available etc. The nature of such efforts can be greatly influenced by the allocation of resources, the assignment of trained personnel, and the conviction of leaders and others of the importance of organizing a strong programme with extensive coverage. There are analytical problems of sorting out the extent to which a strong family planning programme is a reflection of deliberate decisions and efforts, and of the socio-economic setting, but it is clear that both factors play important roles in some countries.

METHODOLOGY

There has been a marked increase in the attention given to population matters during the past two decades. During the 1960s there were literally hundreds of sample surveys among populations in every continent designed to obtain information about people's knowledge about, attitudes towards and practice of family planning (KAP surveys). Scores of quasi-experimental and experimental family planning programmes were undertaken, and most of these contained an evaluation component. The results of such studies were often used by policy-makers and administrators as the basis for deciding whether or not to adopt an official population policy and to implement a family planning programme.

Figure I



The objectives of the various demonstrations or experimental programmes have varied over time, and, in part as a consequence, so has the evaluation of the programmes. There are many components to a family planning programme, and an administrator is appropriately interested in each of the components, e.g., the number of pamphlets produced, distributed and read; the number of radio or television spot messages carried, by area, day of the week and time of day; the number of service points available in a given area for providing contraceptive information, supplies and service; the number of personnel hired, trained and working in a given area, and by category of personnel; the number of acceptors of contraceptive method, by method; continuation rates by contraceptive method; and, of course, changes in fertility and the factors responsible for those changes.

The quality of vital statistics is low in many developing countries and therefore information on changes in fertility rate by year is seldom available. Sample surveys that estimate levels and trends in fertility are relatively expensive and time-consuming, and there are appreciable lags between the events and tabulation and analysis of results. Also, administrators of demonstration and of national programmes are eager to have early indications of the effectiveness of programmes. These and related factors have led to an early interest in the number of acceptors of family planning programmes, and various estimation techniques have been devised for converting numbers of acceptors into number of births averted, and this, in turn, to changes in the level of fertility. It was recognized at an early stage, however, that some acceptors had previously been users of contraception in the private sector; some used their contraceptive method inefficiently and irregularly; some switched to other methods, and not always to a programme method or source; and some discontinued using contraception.

Much of the evaluation efforts a decade or so ago were concerned with problems such as those enumerated above. There is an extensive and sophisticated literature on continuation rates and births averted (United Nations, 1978; Forest and Ross, 1978; Ross and Forrest, 1978; Chandrasekaran and Hermalin, 1975; Gorosh and Wolfers, 1979; Potter, 1969, 1979). There remains a need for sample surveys and in-depth interviews that provide information to an administrator about the workings of the various components of a family planning programme, but increasingly there is interest in fertility change and its determinants, and that is the focus of this paper.

The Population Division of the United Nations and the International Union for the Scientific Study of Population have taken the lead in seeking to improve techniques for measuring the impact of family planning programmes; these programmes are separate but each has kept the other informed, and several of their efforts have been carried out collaboratively (United Nations 1978, 1979; Chandrasekaran and Hermalin, 1975; Hermalin and Entwisle, 1982).

The statistical techniques most commonly used for measuring the effect of family planning programmes are given in table 4 (United Nations, 1979; Hermalin, 1982). The table also shows which techniques give an estimate of programme effect, non-programme effect and total effect. It also indicates

Table 4. Techniques for measuring effect of family planning programme cross-classified by type of effect and type of data

Technique for measuring effect of family planning programme	Type of effect analysed			Type of data employed			
	Programme effect	Non-programme effect	Total effect	Programme variables	Socio-economic	Demographic	Biological
1. Standardization	-	-	x	-	0	x	-
2. Trend analysis	1	x	x	-	-	x	-
3. (Standard) couple-years of protection	x	-	-	x	-	x	0
4. Analysis of reproductive process	x	-	-	x	-	x	x
5. Component projection	x	-	-	x	-	x	0
6. Simulation	x	-	-	x	-	x	x
7. Experimental design and matching studies	x	x	x	x	0	0	-
8. Multi-variate areal analysis	x	x	x	x	x	x	0

Note: x = effect or data involved explicitly.

1 = effect obtained implicitly

- = effect or data not generally part of technique

0 = data of this type occasionally employed or potentially employable.

the type of data needed in order to carry out the analysis. As Hermalin notes, techniques 3 through 6 are based on the number of users of contraceptives from programme sources, taking account of the length and effectiveness of use. The four methods differ in a number of ways, however. A major distinction is between allocating programme effects over calendar time as compared with a summary effect per acceptor or year of acceptance for all the births averted over time.

This paper focuses on empirical studies of experimental and matching family planning programmes, studies of fertility change within specific countries, and cross-national analyses. Therefore, there is no summary of the various methods listed above, both because there are excellent summaries by the United Nations and the International Union for the Scientific Study of Population (IUSSP), as was noted earlier. Specifics of the various methods are given only to the extent that the empirical studies chosen for summary here utilize one of the methods.

Matching studies. Matching studies seek to estimate the effect of an intervention such as a family planning programme on a dependent variable, e.g., fertility. Wells (1975) states that the matching of variables is an accepted and useful method of adjusting for bias in observational studies in which subjects self-select procedures or treatments, and the method can also be used to increase the efficiency of controlled trials or experiments. Individuals in the experimental group, or group that has self-selected a procedure, for example, a specific method of contraception or any method of contraception within a family planning programme, are matched with persons in a control, or more accurately, a comparison group. The variables chosen for matching are crucial inasmuch as the purpose of the matching is to assure that if there are changes in the dependent variable attributable to non-programme factors, those changes will be the same, subject to sampling error, in the two groups (Forrest and Ross, 1978; United Nations, 1978; Wells, 1975). A comparison of changes in the dependent variable before the intervention began, and at a suitable time after the interventions have been in effect will show whether there has been more change in the acceptor than in the comparison group. If the amount of change in the two groups is about the same, one would conclude that the intervention had no appreciable effect. If there was significantly more change in the dependent variable in the acceptor than in the comparison group, one would conclude that the difference in the change between the two groups was due to the intervention, e.g., a family planning programme.

Johnson and others (1978) analysed the impact of the Malaysian family planning programme on fertility by matching acceptor and non-acceptor birth rates. The two groups were matched on (a) month of most recent delivery, (b) age of mother, (c) number of children, (d) duration of marriage and (e) race or ethnic group.

The principal finding was that birth rates among programme acceptors were significantly lower in all six post-acceptance years than in the matched comparison group, and that they altogether experienced 425 fewer births per

thousand women than non-acceptors during this period. Results were examined separately for different age, race, parity and marriage duration groups, as well as by year of acceptance, sex of the most recent child and method adopted. Comparison of this method with a less direct procedure previously employed in Malaysia showed reasonable agreement on the estimated impact of fertility. It was concluded that the national programme had contributed significantly to observed national birth-rate reductions.

A criticism of this type of study is that programme acceptors and programme non-acceptors are not matched on motivation. Therefore, according to this line of reasoning, many of the programme acceptors would have adopted fertility control measures in the absence of a national family planning programme. The authors acknowledge this line of reasoning, and respond that "to the extent that the programme merely substitutes for such non-programmed use, its fertility impact is thus overstated. To counter this argument, the claim may be made that the diffusion of knowledge of fertility reduction methods resulting from an active governmental effort to publicize and legitimize family planning will itself stimulate not only official but also private-sector based contraceptive use. The degree to which these factors offset each other in our programme-impact procedure is unclear" (p. 226). Jones (forthcoming) in a separate analysis states that the major determinants of fertility decline in Malaysia have been socio-economic factors, with the family planning programme playing an important role by helping to legitimize smaller family-size norms and the practice of contraception, and by improving the accessibility of contraceptive information and supplies. He states that the programme can in no sense be considered the prime mover in the fertility decline, nor can its exact contribution be measured.

The demographic impact of an intrauterine device (IUD) programme was studied in Taiwan Province of China, by comparing IUD acceptors with non-acceptors in the same townships that were matched on age at first insertion (four groups), education (three groups), open interval (four groups) and number of live births (five groups). Thus, 240 small groups of IUD acceptors and non-acceptors were compared (Chang and others, 1969; Chow and others 1969). The IUD programme brought down the fertility of the acceptors sharply: from 381 before to 77 after the first acceptance, a reduction of 80 per cent. On the other hand, the corresponding fertility among the matched groups also fell significantly, from 377 before to 195 after, a reduction of 48 per cent.

The authors noted that a fundamental question relates to the higher than average motivation for family limitation among the IUD acceptors. If IUDs had not been available from the programme, many of the IUD acceptors would have adopted other methods of fertility control. The authors suggest that an answer to this type of problem is the matching study which they undertook. Although there was a very significant reduction in fertility among the comparison group, there was a larger reduction in the IUD acceptor group.

In addition to matching of individuals or groups, one can match two sets of areas: (a) where there have been programme interventions, and (b) comparison areas where there has not been a programme. Rochat and others (1971) compared seven countries with programmes in Georgia to contiguous counties without a programme, matched on geographic contiguity, population size and racial distribution. Fertility fell 13 per cent more in programme counties than in the comparison counties. Although a paired design was used, Rochat and colleagues pooled all data for the seven programme counties with the pooled results of the non-programme counties, perhaps thereby obscuring some of the more precise comparisons that might have been made.

Matching studies can be useful in assessing the impact of a particular contraceptive method and of a family planning programme in an experimental or demonstration project. They cannot be used for assessing the impact of a national programme, however, because of the lack of an acceptable comparison group. Perhaps the major problem with matching studies relating to interventions designed to lower fertility is that none of the studies match acceptors and comparison groups on motivation to limit family size. Unless suitable measures of motivation to limit family size are included in future studies of fertility of programme acceptors and non-programme acceptors, it is doubtful that matching studies will provide sufficient information about the impact of family planning programmes to justify the expenditure of personnel time and funds.

Experimental studies. Many field studies have been conducted to determine the impact of family planning programmes, and most of these have been demonstration projects or quasi-experimental rather than truly experimental with adequate control groups (Mauldin and Ross, 1965; Wells, 1975; Freedman and Berelson, 1976; Cuca and Pierce, 1977; Forrest and Ross, 1978; Ross and Forrest, 1978; United Nations, 1978, 1979). A major purpose of demonstration and experimental projects is to assess the feasibility and effectiveness of various types of intervention, with the expectation that promising interventions will be introduced as part of a national programme.

Wells in United Nations Manual IX (1979) has described the principles of experimental designs and notes that the essence of such designs is that two or more treatments among comparable groups are required, but one of the treatments may be no treatment, which becomes the control group. Ideally, there should be random assignment of experimental units to treatment groups prior to initiating treatments. When randomization cannot be done, the study is quasi-experimental. Evaluators must also be alert to contamination or spillover effects which do not necessarily invalidate the results, but which must be taken into account in the analysis.

An example of a well-executed demonstration or quasi-experimental family planning programme is the Taichung action program carried out in Taiwan, Province of China, in 1963. In a highly truncated summary of the study, the authors, Freedman and Berelson (1976, p. 32) describe it as follows:

"Urban and rural areas with 325,000 population; cafeteria of methods including IUD, no pill; four treatments: (1) posters, mailings, and home visits to husband and wife, (2) same, to wife only, (3) mailings and posters only, (4) posters only -- all systematically provided in three densities of application to test diffusion; cumulative acceptance rates range from about 30 per cent for personal visits/high density down to 16 per cent for mail only/low density. Twenty per cent overall; fertility declined more sharply in Taichung compared to other cities in Taiwan in first year following the program, but then decline paralleled general decline in Taiwan."

The Taichung study was carried out when fertility had been slowly declining but was still moderately high, about 37 per 1,000. It was an effort to determine the attitudes of the population about family size and methods of limitation, and their acceptance of contraceptive methods when services were offered. The authors concluded that the people of Taichung did not need to be motivated to limit family size. "They want to plan their families, but they need to know how. Teaching them how - implementing a family planning programme - has proved to be feasible" (Berelson and Freedman, 1964, p. 29). The results of this study were sufficiently encouraging that an island-wide program was adopted shortly thereafter.

Cuca and Pierce (1977) reviewed 96 experimental and demonstration programmes, and classified them as follows:

(a) 46 were concerned with the type and characteristics of personnel suited for certain functions or the type of remuneration that would elicit the most effective performance;

(b) 19 were concerned with the contribution of mass media campaigns to the effectiveness of programmes;

(c) 16 related to the effectiveness of integration of health programmes and family planning services;

(d) 10 were attempts to determine whether intensive campaigns increased the acceptance and practice of family planning;

(e) 14 sought to measure the impact of various schemes for increasing the availability of contraceptives, mostly community-based distribution (CBD) programmes;

(f) 6 tested the impact of incentives.

Many of these programmes were undertaken prior to the implementation of national family planning programmes. There was a particular interest in finding out whether or not family planning was acceptable to the populations under study. The primary evaluation of the programmes was concerned with the

number of acceptors of specific methods of contraception, and of all methods. It was taken for granted, at that stage, that if the proportion females or couples using contraception increased significantly, fertility would decrease.

Cuca and Pierce did not attempt a statistical summary of the results of the various categories of experimental programmes, but they did conclude "that in both the methodology used and the approaches tested past experiments have been less than satisfactory. Most did not fulfill the requirements of classical experimental design, and therefore their conclusions cannot be viewed as definitive answers to the questions investigated. Nevertheless, experimentation has had a significant impact on the development of family planning delivery systems. Experiments have answered some basic questions and have been useful in resolving field problems. They have given visibility and validity to certain approaches and thus paved the way for changes in regular programmes. Though far from perfect, experimentation has been a vehicle for improving the delivery of family planning services". (Cuca and Pierce, 1977, p. 68).

Freedman and Berelson (1976), writing at about the same time, said there had been about 40 pilot, experimental or demonstration family planning programmes of some substance and quality, plus probably a few hundred smaller ones, and they had included special efforts of a health, informational, incentive, local-agent, commercial and "intensive" character. They summarized 15 of those programmes; the results are summarized below:

"So the record is mixed and on the whole not more impressive than the national programs of greater scope, taken as a group. In rough capsule, the small impact of the special projects is to increase practice by 2-5 per cent per year, or approximately what a weak or moderate national program can do in a disadvantaged setting; the large impact over several years is to increase current use up to 20-30 per cent or to reduce the birth rate by about 20-25 per cent (or, say, 8-10 points off a crude birth rate around 40); and the large impact is much more likely to occur among populations in relatively advantaged settings. Thus these projects can be summarized on a rough continuum:

- . Small effect on practice; no or unlikely or trivial on fertility: for example, Sialkot, Isfahan, Lulliani, Khanna, Danfa
- . Moderate or better effect on practice in short-run; unknown effect on fertility (or in long-run practice, usually due to study design): for example, Potharam, Nirodh, Narangwal, Gandhigram, Kaohsiung, Comilla, Ernakulam, Sun Dong Gu
- . Substantial effect on practice; likely effect on fertility: for example, Etimesgut, IPP, Taichung, Koyang, San Gregorio

Most of the projects are in the moderate or substantial categories; and as noted, geographic location (i.e., social setting) is related to outcome." (Freedman and Berelson, 1976, p. 32).

These summaries indicate that experimental programmes have been widely used, and have been undertaken to test a variety of goals. The primary statistical technique used in judging the effectiveness of the programmes has been before/after comparisons of the test and control groups, although some have relied only on before/after measures within the test group.

This section concludes with a description of two studies in Matlab Thana, Bangladesh, which sought to increase the acceptance of family planning and reduce fertility by a community-based distribution programme which made contraceptives more readily available.

The first study, a contraceptive distribution project (CDP), tested a pill and condom household distribution approach; the second study, a family planning-health services project (FPHSP), augmented that strategy with better training of workers, a wider battery of methods, more intensive follow-up and referral services, and ancillary health care.

In the CDP, launched in October 1975, oral contraceptives and condoms were distributed in 153 villages; 80 villages that were serviced by the regular government programme were designated the comparison area. However, since government village-based services had not yet been fully implemented, the studies represented a test of the effects of services versus no services at all. A total of 154 female village workers were recruited and instructed in the distribution of pills and condoms; these women received a minimum amount of training in motivation and follow-up, in accordance with the hypothesis that distribution alone would increase contraceptive usage and reduce fertility (Phillips and others, 1982; Stinson et al., 1982).

A baseline survey of eligible women showed that about 33 per cent of the respondents either were current users of contraceptives or expressed a desire to cease childbearing and an interest in practicing contraception in the future. Three months after the CDP began, however, overall contraceptive prevalence was only 18 per cent, and after two years, it was 12 per cent. Overall use-prevalence in comparison-area villages remained at 3 to 4 per cent throughout the study.

It is likely that the overall impact on fertility of the CDP during its first year ranged from minus 5 per cent to minus 17 per cent (the difference between the observed treatment-area fertility rate and the rate that could have been expected without the programme, using different assumptions about treatment-area fertility). Thus, though modest, the CDP had an effect on fertility in its first year; in its second year, the programme had no effect.

The limitations of the CDP led to the institution of the FPHSP in October 1977. The goal of the new programme has been to replace the CDPs emphasis on contraceptive distribution with an emphasis on comprehensive contraceptive care that would include frequent and regular visits to all women whether they were practicing contraception or not, a wide choice of methods conveniently available, and ancillary health services. The most important change has been

the addition of the injectable depot-medroxyprogesterone acetate to the battery of available methods, and the provision of IUDs and menstrual regulation procedures at health sub-centres.

Introduction of the FPHSP system was followed by a sharp rise in contraceptive prevalence, from 10 per cent in October 1977 to 34 per cent by the end of 1978. Use-prevalence has remained at that level since then. The general fertility rates in the treatment and control areas were almost identical at the beginning of these experiments, but differed by 25 per cent in 1978 (147 and 196, respectively). Similarly, the total fertility rates differed by 28 per cent (4.6 and 6.4 respectively).

MULTIVARIATE AREAL ANALYSIS

Hermalin (1975) summarizes six studies in which areas within a country rather than individuals were used as the unit of analysis. Three of these studies related to the same country and to approximately the same time period; the results illustrate the effects of different models and variables used in the analysis. The three other studies did not use fertility measures as their dependent variable, but did use couple-years of protection and measures of acceptance of IUDs and sterilization. Although there was some overlap in the independent variables used in these studies, the differences seem greater than the similarities. Programme input measures were far from uniform in the different studies and, no doubt because of data availability, were simpler summary variables than would be desirable. Each of these studies showed that programme inputs have positive effects on programme acceptors or negative effects on fertility, but the lack of comparability in the studies limits further generalization.

Similar studies have been undertaken of Barbados (Jones, 1977) and of Chile (Taucher and Bocaz, 1978), but lack of data placed limitations both on their socio-economic and programme input variables. In Barbados, no programme input measure was used in the regression analysis, but the spatial distribution of women contacted by family planning field workers was compared with the patterns of residuals from the regression of 1970 fertility on the independent variables. It was concluded that although anomalies exist, there is evidence of spatial influence of family planning activity. The study of Chile was an exercise comparing the results of different analytical methods. No suitable measure of programme inputs was available, but in the interests of demonstrating the different analytical techniques, a proxy was used for programme input, the percentage of coverage of the family planning programmes.

The analysis of determinants of fertility change, using areas within countries as the unit of analysis, is a promising approach. It has been used seldom, primarily because of the difficulty of compiling demographic, socio-economic and programme input data for the same geographic areas. Also, neither analysts nor programme administrators have devoted much attention to defining and collecting the key components of family planning inputs. As a

consequence, the various multi-variate areal analyses, with the exception of studies by Hermalin and Schultz which apply to the same areas and at about the same time, are not sufficiently comparable to permit generalization beyond each study.

EMPIRICAL COUNTRY STUDIES

There have been many articles on the causes of fertility change in developing countries since the introduction of population policies and family planning programmes, but the number of monographs and books looking in depth at fertility change within a country are relatively few. There have been detailed studies on Singapore (Chen and Fawcett, 1979) and Taiwan, Province of China (Freedman and Takeshita, 1969). There was an earlier study on the Republic of Korea which carried the analysis up to 1966, but the family planning programme had been in existence only a few years at that time (Kwon, 1977). The Panel on Determinants of Fertility Change of the United States National Academy of Sciences has detailed studies underway on determinants of fertility change in Brazil (Merrick and Berquo), Colombia (Menken, Ochoa and Hill), Cuba (Hollerbach and Diaz Briquets), Indonesia (McNicoll and Singarimbun), the Republic of Korea (Cho, Arnold and Kwon), Syria (Hill), and Thailand (Knodel, and others). Several of these studies have been completed; the others were due to be finished before the end of 1982. Similarly, the Committee on Studies for Population Policies in Developing Countries of the IUSSP developed a research programme model and commissioned case studies in five countries - Egypt, El Salvador, Nigeria, Sri Lanka and Zaire, but these studies are not yet in the literature. The National Academy of Sciences developed outlines of topics to be covered, but recognized that both data availability and time constraints would restrict comparability among the studies. The IUSSP Committee articulated a specific model to be followed but, to the best of the author's knowledge, this strategy has been only partially successful. None the less, efforts such as these will provide a better understanding of fertility determinants within specific countries, and, more importantly, will help in the development of guidelines for future studies.

A major generalization that emerges from the various country studies is that most analysts have not been able to quantify the impact of specific socio-economic variables, or their combined effect on fertility decline, nor of programme impact. In the case of Singapore, the authors conclude that constraints on availability of housing and the effects of employment opportunities for women may account for much of the change in fertility, but only suggestive evidence can be cited. They also say that the widespread availability of fertility control methods through an effective national family planning programme, and easy access to abortion have contributed significantly to fertility decline. This type of finding, though with varying emphasis, is typical of many of the country studies. Mercedes Concepción has observed that the national population programme of the Philippines has had a profound effect on fertility decline. Knodel, in several of his writings, has concluded that the family planning programme of Thailand has been the prime contributor to

fertility decline in that country. The analyses undertaken by these authors are convincing, but the conclusions are qualitative, rather than quantitative. There are a few exceptions. Cho and Retherford note that one estimate is that a little more than one third, 37 per cent, of fertility decline in the Republic of Korea from 1963 to 1973 is attributable to the national family planning programme. It is also clear that fertility decline has occurred in some developing countries in the absence of a national population policy to reduce rates of population growth and in the absence of a national family planning programme. Brazil is such an example. On the other hand, Chinese authors have written that none of the relevant demographic and socio-economic factors have changed sufficiently to affect fertility significantly, but that the determining factor has been the Government's birth planning policy and programme.

INTER-COUNTRY STUDIES

The World Bank undertook an analysis of the relative importance of socio-economic variables and of family planning programmes on fertility decline in preparation for the World Population Conference in 1974. Fertility data were not available at that time, and the study used rates of contraceptive use from programme sources as a proxy for fertility. The study found that family planning services points alone accounted for 62 per cent of the total variance in programme user rates. There was an association between the location of service points and socio-economic variables, but the degree of dependence was not very high. Socio-economic variables appeared to have greater explanatory power than programme input variables, although the difference was marginal. The study concluded that, on the whole, both social change and family planning programme play a positive role in promoting increased contraceptive practice and a decline in fertility (King, 1974).

Srikantan (1977) carried out analyses of fertility decline in 20 countries using a variety of demographic and socio-economic indicators, two family planning programme input variables (a measure of medical personnel and one of programme expenditure) and five programme output variables (reflecting the levels of programme and non-programme contraceptive use among married women of reproductive age). Srikantan found that the direct effect and the total effect on fertility of the demographic-socio-economic indicators was 35 per cent and 52 per cent, respectively. The programme input variables had a small effect of 9 per cent, while the programme output effect was 39 per cent. Srikantan explains the small programme input effect as partly a reflection of the lack of suitable and comparable input indicators for the different countries. He interprets his results to mean that the programme has an impact on fertility that is at least as large as the direct effect of the demographic-socio-economic indicators. In addition, he found that there is positive interaction between the two sets of factors in their fertility impact. On the one hand, socio-economic change facilitates programme implementation; on the other, programme inputs have a net spillover effect

(the effect of the educational and informational components of the programme on users outside the programme that more than offsets programme substitution (the shift from non-programme to programme contraception)).

Bernard Berelson and the author performed an analysis of fertility decline from 1965 to 1975 in a large number of developing countries (Mauldin and Berelson, 1978). The analysis focused on how much of the fertility decline was associated with such socio-economic variables as health, education, economic status and urbanization - modernization as a whole - and how much with population policies and programmes, primarily family planning programmes that were designed to reduce rates of growth. Considerable attention was devoted to deriving a measure of family planning programme input, and information was compiled on 15 programme variables for each country. The variables used were:

- (a) Fertility reduction included in official planning policy;
- (b) Favourable public statements by political leaders;
- (c) Contraception readily and easily available, publicly and commercially, throughout the country;
- (d) Customs and legal regulations allowing importation of contraceptives not manufactured locally;
- (e) Vigorous effort to provide family planning services to all married women of reproductive age (MWRA);
- (f) Adequate family planning administration structure;
- (g) Training facilities available and utilized;
- (h) Full-time home-visiting field workers;
- (i) Post-partum information, education and service programme;
- (j) Abortion services openly and legally available to all;
- (k) Voluntary sterilization services (male and female) openly and legally available to all;
- (l) Use of mass media on a substantial basis;
- (m) Government provides substantial part of family planning budget from its own resources;
- (n) Record-keeping systems for clients at clinic level and for programme service statistics;
- (o) Serious and continuous evaluation effort.

The data were examined using a variety of methodologies: simple correlation among variables; multiple regression; path analysis; a relatively new technique called exploratory data analysis; relation of socio-economic level and programme effort to both absolute and percentage declines in fertility; and cross-tabulations of programme effort with an index of socio-economic variables. The results of these analyses show that the level of modernization as reflected by seven socio-economic factors has a substantial relationship to fertility decline, but also that family planning programmes have a significant, independent effect over and above the effect of socio-economic factors. The key finding probably is that the two - social setting and programme effort - go together most effectively.

Other studies using countries as units could be cited, but the ones summarized above illustrate the modes of analysis used and the results, which are similar in most studies, that are obtained. There are disadvantages to using countries as units of analysis for a number of reasons, including the tremendous variation in both geographic and population size of countries, and variability within countries of each variable included in the analysis - income, education, health indices, ethnic composition, family planning facilities and performance etc. - but there is also a need to learn what factors have validity in different settings.

CONCLUDING REMARKS

The principal policies and programmes considered by Governments to influence fertility include various legal measures, economic incentives and disincentives, policy statements and family planning programmes. More developed countries that seek to affect fertility rates typically wish to maintain, or raise, fertility rates to replacement level or slightly above. Various measures to offset in part the cost of children and of childbearing have been adopted in a large number of countries, but typically more as a welfare measure than as an economic incentive for increasing fertility. In addition, several Eastern European countries have tightened abortion regulations in an effort to increase fertility. Many of these measures have been in effect for relatively short periods of time, and it is technically difficult to separate timing changes in childbearing from cohort completed fertility. There is some evidence that these measures have had a modest effect in some countries, although scholars are not in complete agreement in their interpretation of the data.

In developing countries relatively few legal measures have been adopted with the intent of affecting fertility. A few countries have increased minimum legal age of marriage with the intent of decreasing fertility. An increase in age at marriage has occurred in many developing countries, and has been an important factor in a decrease in fertility, but for the most part these changes have been induced by social and economic circumstances rather than by legal measures. Regrettably, there is almost no information about efforts on the part of Governments to enforce the legal age at marriage. Many scholars argue that changes in legal age of marriage must follow or accompany social change rather than precede it. At the present time there is little evidence that Governments of less developed countries have attempted to use legal measures to influence fertility downward, and efforts to measure the impact of such measures are virtually nonexistent.

Economic incentives and disincentives to communities and clients are increasing, but they have not been used extensively until quite recently. There is ample evidence that payments to acceptors of sterilization is an effective way of increasing the use of sterilization as a contraceptive measure. The use of sterilization is not generally widespread in many developing countries, however, and the impact of economic incentives on

fertility rates for large groups of countries has not been documented except perhaps for India. Many observers cite suggestive evidence that incentives and disincentives have been very effective in decreasing fertility in China, but adequate data for empirical analysis are not available.

Large scale family planning programmes designed to bring about changes in so complex an area as fertility consist of many elements, and vary in coverage, intensity, content and quality. They are carried out in differing social, cultural, political and economic situations, and each of these factors may have an important influence on levels and trends of fertility. Policy-makers, programme administrators and social science analysts have been interested in many aspects of population policies and programmes, and the evaluation of programme activities reflects this wide diversity of interests. Studies have been concerned with a wide range of activities such as the effects of introducing a specific contraceptive method, assessment of information and education programmes; selection, training and performance of different kinds of personnel; availability of contraceptives; service delivery systems; participation of the private and public sector etc. As a consequence, many of the evaluations of family planning programmes are not comparable, nor should they be. Nevertheless, there remains a need to assess the impact of family planning programmes on fertility change.

The United Nations Population Division has sought to lessen the particularistic nature of much of the research through a series of workshops, encouraging a series of projects that apply different methods to a single programme setting, and through its own work. These activities have sought the active participation of individual scholars and of the International Union for the Scientific Study of Population. The state of the art in the analysis of determinants of fertility change has improved significantly as the result of these and related efforts, and there is the promise that advances in analysis during the next several years will be even more rewarding.

Analysis of the impact of family planning programme on fertility would be improved if there were comparable and valid measures of the key elements of family planning programmes, more systematic analysis using areas within countries as units of analysis, more comprehensive but comparable studies of fertility changes within countries, and with more attention given to the proximate determinants of fertility, including their determinants. Attention should also be given to the use of statistical techniques such as exploratory and confirmatory data analysis. In the view of the author, the lack of attention to conceptualization and measurement of the key elements of programme inputs is the most obvious reason for the need to assess the impact of family planning programme on fertility change.

There has been much progress in the field during the past decade and a half, and it may be concluded that though precise quantitative credit cannot be allocated among socio-economic factors, institutional factors, and policies and programmes, there is considerable empirical evidence that large-scale family planning programmes, when well managed, have a substantial effect on fertility independent of the influence of socio-economic factors.

Notes

1/ "Reporter talks with Cui Yueli, Minister of Public Health", Joint Publications Research Service, No. 82049 (21 October 1982), p. 18.

2/ S. Tezcan, "A comparative study of induced abortion in Turkey using the Randomized Response Technique versus direct questioning", thesis, (Chapel Hill, University of North Carolina, 1977); L.P. Chow and R.V. Rider, "Epidemiology of outcome of pregnancy in diverse cultures and in selected countries", report prepared for the Agency for International Development, (1972), pp. 43-101 and 248-251.

3/ S. B. Hong and C. Tietze, "Survey of abortion providers in Seoul, Korea", Studies in Family Planning, vol. 10, No. 5 (May 1979), pp. 161-163.

4/ International Planned Parenthood Federation, Survey of World Needs in Family Planning, (London, 1974).

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C. Notes on the local context of
demographic change

Geoffrey McNicoll*

The institutional premises of the World Population Plan of Action adopted by the United Nations World Population Conference, 1974, are few and simple. At one level, sovereign national Governments seek to promote their development objectives in a harsh world environment, with their internal demographic make-up one of the factors (sometimes, it seems, a fairly minor one) helping or hindering their efforts. Befitting its United Nations aegis, the Plan pronounces on the kinds of rearrangements of the international order that it asserts will speed national development. Below that level, individual citizens within each country, whose declared endowment of human rights includes the right to choose the number of children to have, are grouped into individual welfare objectives. Quite tentatively, the Plan discusses internal societal rearrangements that might bring the free demographic decisions of individuals better into line with national interests.

The specific suggestions put forward in the latter case, not surprisingly, are drawn from the conventional wisdom of the population field at the time, albeit with a notable change of emphasis in the comparative down-playing of family planning programmes. To lower their fertility, if that is thought to be in their national interest, countries are invited to encourage appropriate education about responsible parenthood and (those that have them) to consider integrating family planning programmes with health and other services; elsewhere, countries should concentrate on socio-economic transformation - striving to improve infant and child mortality, women's status, educational levels and social justice, as aspects of development programmes that have a "decisive impact" on fertility (paras. 30, 31).

A reassessment of these suggestions after a decade - a substantial interval in the time scale of modern attention to population issues - is a salutary task. New research should be able to deepen the analysis on which the initial prescriptions were based. In particular, the recent experience of fertility decline in many third world countries can be mined for new insights into fertility determinants and policy options. These notes seek to contribute to this reassessment.

*Senior Associate and Deputy Director, Center for Population Studies, The Population Council, New York.

Conditions for fertility decline: locus of debate

The twin prongs of a government antinatalist strategy implicitly endorsed in the Plan of Action (and embodied in most writing on population policy) are, first, actions that directly or indirectly raise the net costs of children to parents, and, second, measures that reduce the monetary and psychic costs to individuals of fertility regulation. Families in the Plan, although "the basic unit of society" (para. 14), exist in a curiously empty world - autonomous entities exercising their rights to reproduce under the influence of disembodied forces of economy and culture.

Largely ignored is another group of factors that also impinge on fertility and where government interventions, for better or worse, have profound effects on demographic outcomes: the local economic, social and administrative arrangements of the society above the level of the family. Conceptually, of course, the fertility effects of these arrangements can ultimately be assessed in terms of the economics (if broadly enough construed) of marriage, of children and of fertility regulation; but both in interpreting country experience and in discussing policy issues, a separate treatment of them is valuable.

Until the 1970s there would probably have been a fairly wide consensus as to the social and economic conditions that support a low-fertility regime. Success in economic development was of course the underlying factor, generating sufficient conditions for fertility decline. But specific facts of development could be tied more directly to demographic change: fertility decline was promoted by, for example, increased private costs of children, especially in terms of education; higher rates of female participation in the formal labour force, both before marriage and after childbearing; and the emergence of institutional alternatives to family support networks in smoothing life-cycle fluctuations of income and in coping with risk. The identification of such constituent factors provided detailed guidance for policy: in the Bucharest rhetoric, it was not development itself that was the best contraceptive but the diminished economic value of children, more female employment, or state provision of social security.

Yet something was lost in this move from the general to the specific. The separate conditions supposedly conducive to low fertility were of course not individually sufficient; but nor were they assuredly individually necessary. Striking exceptions came too readily to mind.

There had always been cases - historically, France was the classic one - where low fertility had been attained seemingly against many social and economic odds (sometimes in the face of vigorous government efforts to oppose it). Usually, explanations for them could be framed in terms of economic exigencies, especially as a consequence of gradually raised and then dashed aspirations. And France, everyone could agree, was sui generis. Other apparent anomalies - a number of Caribbean countries with fairly low fertility as early as the 1950s, for example - largely escaped notice. But China,

showing large fertility declines since the 1960s, was a startling new fact, and with 30 per cent of the third world's population could not be classified as an exception. Nor could other low-fertility regions: Kerala and Tamil Nadu in India, East Java in Indonesia, virtually all of Thailand, or Sri Lanka, to mention only some of the more striking instances. Fertility decline in such regions among poor, predominantly rural populations, suggested that straightforward linking of demographic and economic change left out important parts of the truth.

Candidates for such omissions were many. Three of the most popular, each with strong support on other grounds, were expansion of formal education, reduction of inequality in income distribution and enhancement of the economic position of women.. In each of these cases, however, and in others too where congenial statistical associations could be found with fertility (although in the case of income distribution even the statistical conclusion was controversial), the likelihood was that the specific characteristic, in addition to whatever direct influence it had on fertility, was also a reflection of some of the same conditions that made for lowered fertility. For education, the sources of demand for schooling are a large part of what calls for investigation if the fertility connection is to be understood; for income distribution, the same is true for the underlying features of the economy and polity that generate observed distributions; for women's status, attention should focus on the supports for an existing pattern of power relationships within the family and for a gender-segmented labour market outside it. Moving the debate to these grounds makes the analytical task at once both more coherent and less accessible to familiar quantitative methodologies. In the discussion below three interdependent sets of issues are treated that pertain to this debate, loosely grouped under the headings of locality, administration and mentalities.

Locality: Economic and social configurations

Shifts in territorial social organization, in the ways and degrees to which individuals are linked to local community and to other kinds of social grouping with a territorial basis, are among the most familiar institutional changes that accompany development and demographic transition. The stereo-typical picture is of a cohesive, all-embracing village community gradually losing its members through urban migration and losing authority over those who remain. In essentials, this picture survives the fairly drastic revisions that have punctured whatever Elysian qualities observers once attached to the initial state: the village as a hotbed of class struggle, factional strife and interpersonal feuds lends itself less readily to casual personification than did the idyllic village republic but may still have been no less a source of rigorous social control over most members' individual behaviour.

The reasons for the weakening of village authority structures are well known. They include the geographical widening of labour markets allowed by improvements in transport, making extensive rural-based commuting a

commonplace; the growth of rural non-agricultural occupations, which leaves full-time farmers and farm workers a diminishing minority of the labour force even in what are still thought of as agrarian economies; the pervasive monetization of exchange relations, which converts localized patron-client ties into more anonymous contractual arrangements; the penetration of urban consumer values and consumption patterns into rural hinterlands and so on. Countless village studies around the world document such trends and changes. Even if the economic pressures making for rural-urban migration run up against countervailing forces - increasing urban disamenities or unaffordable housing, for example - much earlier than had been expected, so that rural populations do not decline in absolute numbers, the village's future will likely more closely resemble the modern bedroom suburb than an organic community.

The demographic implications of these past and prospective changes are complex and variegated. Unlike the historical situation in Europe or Japan, in most of the contemporary third world community influence over demographic behaviour has not been directed towards control over marriage or establishment of a household. Indeed in many societies the emphasis has been quite the opposite; social pressures have compelled very early female marriage and early start of childbearing. The community control, such as it has been, has applied rather to birth intervals, with breast-feeding or post-partum taboos as the instrument and net reproduction rather than fertility as the (perhaps unrecognized) goal.

Such an arrangement may have been needed in coping with very high mortality, but it meshes also with the requirements of sustaining patriarchal social systems, with lineage-dominating conjugal ties. (See the illuminating analyses of West Africa examples in Lesthaeghe, 1980, and Caldwell, 1982, chap. 3). It was by no means limited to those societies, however. In much of East and South-East Asia and South India, for example, families have for long been essentially nuclear in form, with women not typically subjugated to the husband's family or tightly constrained in occupational choice. Yet there too the fine-tuned control of local demography through marriage in the European/Japanese pattern has not emerged.

As social control at the community level has receded, families and their individual members have gained greater autonomy while losing whatever informal insurance function (minimal though it may have been) the former regime supported. For fertility, decisions may well have to be made on a more narrowly economic basis than before. The timing of this process has varied widely by region, located generations ago in some, and just begun in the last two decades in others. There are similarly wide differences in the nature of the rural economy into which families are cast - in terms of its technological level and the alternative kinds of institutional arrangements it offers, and hence in terms of the economic incentives influencing fertility that it contains.

The variety of situations here has been the fly in the ointment of classical demographic transition theory. Fertility decline is by no means a necessary consequence of attenuated patronage and community roles; continued

high fertility reflecting an income-diversification strategy by families is one plausible outcome, for example. An economy's employment structure (particularly, the opportunities it offers for female and for child employment), the return it confers on education, and the degree of employment security it affords are important factors in characterizing fertility incentives. Any comprehensive analysis of the determinants of rural fertility trends must take these factors into account. Development policies that try to impose new organizational forms on rural labour have potentially significant fertility implications (see below).

Communities may of course lose any significant control over the economic life of their members while retaining it in certain other domains - such as in defining appropriate marriage ages or asserting standards of morality. This situation arises especially when work is largely located outside the community's boundaries - as, for example, in the case of fringe settlements providing daily workers to urban labour markets. Economic interest here would likely militate against population control even if it were a feasible social policy. Rural villages or urban settlements in effect might individually benefit by exploiting the rest of the economy through migrant labour (commuting, short-term migration, or even long-term migration provided remittances continue), in a classic "prisoner's dilemma" situation analogous to that usually defined at the individual or family level, with no expected gain from fertility limitation.

Administration: non-programmatic government

The main institutions that have picked up functions that once were the province of the local community are of course those of government, national and local. In any country there is an inbuilt tension and potential for conflict between vertically-structured, sectorally-defined government activities, extending down to individual families or citizens, and horizontally-organized units of local government. In developing countries the former tend to get more publicity (and control contacts with international agencies) while the latter turn out to be more crucial in determining results. As development proceeds, at least in the contemporary world, modern information and control technology enables national governments to bypass this local involvement when they wish, and the role of local government tends to become increasingly trivial. (Although predictions have sometime been made that third world countries would leapfrog into this new age of information and control, there are few indications of that happening. Population registration systems, widely used elsewhere as an aspect of political control, are one instance where this shift might be expected to have occurred, but for the most part these remain tied to local government.)

The withering of local government over the course of development should have important benefits for the economy. It removes a potentially damaging impediment to innovation and easy factor mobility at a time when those characteristics are increasingly needed for vigorous economic growth. (Local

government is not intrinsically detrimental here, but it would be naive to suppose in practice under most regimes that it is not. At the least it would tend to be "rent-seeking" - see Buchanan and others, 1980.) Conversely, where political choice dictates a continued strong role for local administration, there is likely to be considerable economic cost in foregone growth. The recent administrative history of China provides an interesting case in point. One main thrust of the Dengist reforms has been to pull back local administration from the commune to the county level. The communes were initially super-imposed on market areas (and usually headquartered in market towns); at the short-lived peak of Maoist radicalism in 1958 there were fruitless efforts to make these gangling units into cohesive, solidary groups; since that time the commune has gradually yielded authority - especially devolving it to the brigade, a unit with some social reality - and the latest changes have virtually left it a market town again. The retreat all along has been for hard-nosed economic reasons.

But how does demographic change fit into this picture? The incompatibility, which as suggested, exists between the style of local administration that is most conducive to economic growth and the style that in effect has evolved for political control, has important implications for population growth and population policy. To the extent that fertility is a part of parental economic strategy, local government sets the ground rules within which planning has to be undertaken and defines the contingencies that need to be allowed for. Where the system limits upward economic mobility, the second-best strategies that families resort to may well involve different (presumably higher) fertility outcomes - a trade-off recognized in classical demographic theorizing.

Population policy as a national programmatic activity also typically seeks to work through local administration in some measure. Its achievements thus can be constrained by the nature and scope of that system. In particular, as discussed further below, some of the most effective antinatalist policies have been those that allied themselves closely with local government and succeeded in mobilizing its energies to promote their programme goals. Here proposals for administrative reform can pose a conflict between economic and demographic ends in an acute form.

Mentalities: traditions great and small

It would simplify matters greatly to believe (as many social scientists do believe) that cultural influences on behaviour are merely a kind of aura surrounding material realities, creating a slight interference for hard-headed analysis, adding to the error term of one's regressions but basically a peripheral concern. The history of research on peasant economy lends some support to this view: efforts to portray peasant farmers as operating outside a straightforward economic calculus, seeking a "limited good", clinging to tradition-bound behaviour and so on, have been largely discredited. In some ways the model of the peasant as a fine-tuned profit-maximizer is now more

firmly ensconced in the economic literature than the analogous assumption applied to the modern corporation - trends in the theory of the firm are decidedly in the opposite direction. But it does not follow, even if the "rational peasant" turned out to be more rational than the rest of us in his economic dealings, that demographic behaviour too is thereby taken care of. Becker's dictum that "all human behaviour can be viewed as involving participants who maximize their utility from a stable set of preferences and accumulate an optimal amount of information and other inputs in a variety of markets" (Becker, 1976) becomes progressively less helpful as the subject moves further away from getting and spending. Fertility is quite far removed.

This said, one can go a long way in explaining demographic change without having to draw on the cloudy techniques of cultural analysis. That does not mean that the cultural content here is slight, but rather that cultural change can lead to concomitant changes in social organization that have a convenient tangibility when it comes to analysis. (The direction of causality can also of course be the opposite.) Thus, the important cultural change associated with the "opening" of village communities - the gradual loss of the localized "little tradition" and its replacement by a more uniform set of values of an urban-based popular culture - can be treated as if it were a by-product of the organizational change.

More problematic is the case of cultural change that does not seem to have a social structural counterpart. It can sometimes be argued that this is a lag phenomenon: fertility, for example, remains at a previous high level for some time after socio-economic conditions shift towards favouring lower fertility, but the reaction time, perhaps because of the internal coherence and thus stability of the values involved, is long. Conceding such a cultural system, however, even if loosely articulated and not free of inconsistencies, identifies a potentially important subject for study. The widespread casual use of the term "diffusion" in fertility analysis, as if it were explanatory rather than simply descriptive, underlines the need for pursuing that research direction. The reasons that some ideas "diffuse" and not others must be sought in specific local cultural and social structural environments.

Posing still more difficulty is the case where fertility change seems to occur simultaneously over widely different economies and societies. Bourgeois-Pichat (1981) has pointed to this happening in Europe in the reversals of fertility trends occurring around 1942, 1965 and possible 1980, and argues that it presents a phenomenon calling for a wholly new (and as yet undeveloped) approach to understanding demographic change. Even here, however, the starting point is held to be a thorough knowledge of local situations.

Premises about the determinants of fertility

There is little value in stressing the importance of the local context of fertility change, either as a matter of understanding or as a guide to policy choice, if disagreement persists over the nature of fertility determination.

Many disputes over strategies to regulate fertility indeed do seem to originate in such differences of view. Not, of course, about the immediate biological and behavioural factors accounting for variations among fertility rates - the so-called proximate determinants: those are comparatively well understood, and the unresolved issues are mostly technical. The source of disagreement concerns rather the nature of the influence of socio-economic and cultural factors on fertility and the nature of fertility decision-making. It would be a diversion from the purpose of these notes to discuss the intricacies that surround the subject of fertility determinants (they form the content, for example, of a massive, just-concluded study conducted by the United States of America National Academy of Sciences - see Bulatao and others, 1983), but a very brief statement of the theoretical position taken here is a necessary basis for the later comments on policy.

Four propositions describe the present framework.

(a) The factors that are consciously taken into account and thus implicitly traded-off against each other in making fertility decisions define a person's domain of adaptive behaviour for fertility. Within such a domain the economist's consumer-choice model or its psychological equivalent is appropriate for analysing fertility outcome (aside from the element of chance that is always present). Such a domain may be so narrow as to leave little scope for deliberate choice (as in a situation of so-called "natural" fertility), or be so large that the boundaries are irrelevant.

(b) The boundaries of such a domain are governed by the particular institutional and cultural setting experienced by the individual, which brings certain factors into opposition with fertility and not others. Changes in this setting may indirectly elicit changes in individual behaviour, but not through a simple one-to-one mapping. Exploration of the dynamics of changes in this setting is likely to play a major part in the explanation of fertility change.

(c) Fertility decline may entail a radical widening of domain boundaries (as from natural fertility, to the fully-controlled fertility model), a shift in boundaries (possibly a narrowing), or a change in the economics of fertility within a constant domain.

(d) Different groups in a population (particularly groups defined by culture or economic setting, but possibly also men and women) may experience different routes of fertility transition. (Changes in the relative sizes of such groups are obviously one source of overall fertility change.)

The major task of analysis of fertility change in the terms of this framework is to explore the shifting pattern of constraints on adaptive behaviour in fertility over time, and in particular over the course of economic development, relating this pattern to economic, institutional and cultural change in the society.

Accommodated within this framework are various familiar models of fertility change:

(a) The "Coale transition". Here fertility decline is seen as a shift from a "natural fertility" regime to a regime of deliberate individual birth control by parents, induced by unspecified cultural or institutional changes in the society - in effect, expanding the domain of adaptive behaviour (or moving away from a boundary solution). (See Coale (1973));

(b) The "Chicago transition". This is a cutback in the demand for children resulting from a straightforward rise in their relative cost, typically associated with an increasing value of time. No domain shifts are posited;

(c) The "Caldwell transition". In this model a decisive change in the constraints on adaptive behaviour is proposed. Children, from being associated with parental - and especially patriarchal - consumption, come to be linked instead to patterns of sentiment within the nuclear family group.

The framework of course allows for other kinds of fertility transition too, some of which will be briefly examined in the course of the policy discussion below.

Scope for population policy

Earlier, the author stressed the relevance for demographic behaviour of the local socio-economic and cultural environment within which families are placed, and of the ways in which that environment changes over the course of development. Within the present compass it is of course not possible to take account of the variety of development patterns and hence the picture sketched here tends to exaggerate commonalities in the process. But it can reasonably be argued too that many apparent differences in these patterns have fairly superficial local significance. Government ideology and national policy that at first sight seem so distinctive often thin to a rhetorical veneer as they extend outwards from the capital and downwards to local administrative levels. It is not that a government's role in development is necessarily ineffectual when it entails promoting grass-roots change, but rather that success or failure in that endeavour hinges largely on the way in which the effort makes use of, rather than conflicts with, the realities of local social organization.

In the contemporary world the situation, moreover, is complicated by the fact that these realities are themselves changing quite rapidly over time, under the influence of factors some of which are hardly within government control - notably, population growth itself, and changes in values and outlook associated with expanding education, technological advances, and greater awareness of and contact with the modern world.

Under these conditions, and given that population growth is perceived as a burden on the development effort, what is the scope for government policy designed to lower rates of fertility? The temptation to evade the complexities of the local setting in designing policy is obviously great, and is rarely resisted. Two courses of action, covering the majority of antinatalist

policies in the third world today (and, for that matter, the pronatalist policies in the first and, more particularly, second worlds), illustrates this evasion.

The first course has been to limit programmatic action to management of an efficient distribution system for modern contraceptive supplies and services, together with attendant publicity. Local-level social organization is recognized only to the extent of often locating supplies (for methods not needing clinical supervision) in individual small communities, and cultural distinctiveness is catered to only by offering a mixture of methods. The empirical justification for this policy course is found in responses to survey questions asking reproductive-age women about their desired completed family size, questions that routinely reveal a substantial gap between stated fertility desires and likely fertility outcomes - an "unmet need" that a family planning programme endeavours to fill. As market research, the surveys yielding these findings are singularly unenlightening (it is hard to imagine a corporate client being satisfied with such a basis for investment in a distribution network). Yet for them to go further in exploring the depth of demand, its price elasticity, and the countervailing constraints in institutions and culture that might deflect individual behaviour from declared desires or intentions would take them deep into the dimensions of local society discussed earlier. (It would also, of course, rapidly reach the useful limits of survey research and call for different information-gathering strategies.)

The second broad course of action in population policy that has equally sought to skirt these intricacies has been derived from the aggregate statistical associations of education, child mortality, women's status and so on, with low fertility. Reading causality into these relationships yields policy recommendations that call for wholly unexceptionable measures well within the mainstream development programme of any even moderately progressive government. (Somewhat more sensitivity accrues to policies of income redistribution or emphasis on basic needs, but at least rhetorical approval of such goals is widespread.) What is not usually part of the policy content is specification of the local-level detail of the programme intervention. Yet in virtually each case (mortality reduction is probably the sole exception) the fertility impact depends in large measure precisely on that detail. Here is the likely source of the considerable statistical noise in the aggregate relationship. The broad similarities of programme action in the particular policy area among countries can account for the relationship being detected through that noise, but the policy instrument thus derived is extremely blunt. To hone it calls for grubbing about in the unexplained variance.

A curious feature of these two dominant policy courses should be noted. Both are largely free of political costs. Family planning programmes obviously absorb resources that have opportunity costs, but their share of the budget tends to be trivial; moral objections, with fairly few exceptions, have proven evanescent and readily catered to by adjustments of method mix. Development programmes that have a hoped-for fertility pay-off are generally seen as goods in themselves, and political battles over them, if needed at

all, are fought well away from demographic territory. This situation should probably arouse suspicion: can a social change as profound as, say, a halving of average family size be attained through policy measures that exact no appreciable costs? A free lunch of this sort is on the face of it implausible. Perhaps the policy bite here is less than meets the eye.

Both of the two policy directions have claimed substantial successes, and in combination they are taken by many observers to account for most of the current fertility declines in the third world. Yet a case can be made that such success has been in fair degree accidental - an outcome of changes in society and economy that owes little to awakened government concerns with rapid population growth. Even where government action has been influential, an element of fortuitousness probably remains: the reasons may have as much to do with the happenstance of local conditions that are conducive to fertility decline as to the intervention itself.

The argument, in other words, comes down to this: a lack of close attention to the local-level content of policy action, and to how that content meshes with existing features of local polity and culture, leads to an erratic record of accomplishment. Even when positive results can be convincingly claimed, very likely they have far from fully exploited the existing potentialities for change, or have been attained at higher social costs than was necessary. A corollary is that an analytical focus on local setting rather than on vertically-defined programme activity (whether in family planning or development) will better illuminate the range of options for population policy and may well point to directions not yet explored.

Some examples will help to give substance to this argument, drawing on the schematic model of fertility outlined in the previous section.

Increasing the salience of the economic calculus of fertility

There is evidence in many third world settings that children confer net economic benefits on their parents or on others (such as husband's lineage) in a position to influence fertility patterns. Even if children imposed a net burden, moreover, they may still be economically valued in the absence of any more secure means of storing value for the parents' old age or of hedging against misfortune. In these settings any increase in the salience of fertility decisions as an aspect of family economic strategy would merely reinforce high fertility levels.

Yet in other situations this may well not be the case. The conventional family planner's view of fertility transition is of natural fertility slowly supplanted by individual awareness of the manifold benefits (among them, economic benefits) of smaller families, converting a latent unmet need for contraception into effective demand - a Coale transition. Making demand effective, in this congenial world, simply calls for publicity campaigns promoting family planning methods.

Other initial states in which economic decision-making is impeded by countervailing cultural or institutional circumstance may equally be cases where the issue is the salience of the fertility calculus rather than the net balance of incentives. An illustration of such a situation would be Indonesia in the 1960s: there it can be argued that a combination of the extreme politicization of day-to-day life, where every local dispute or policy debate was cast in terms of increasingly violent party politics, and the uncertainties of an economy sliding into hyper-inflation, precluded the necessary degree of stability of setting that is plausibly required for long-range family economic planning to make sense. Stability was attained following a resolution of the political impasse, creating a setting in which the economics of fertility could come to the forefront as a matter for individual decision-making. (See McNicoll and Singarimbun, 1983.) Analogous if less striking cases than this particular one are probably common.

Linking fertility policy to local administration

Earlier in this paper a distinction was made between administrative systems that while functioning to maintain political stability incidentally quenched economic innovation, and those that were intentionally minimalist as a means of promoting growth and technological advance. Where the pace of economic growth is rapid, the chances are, on the one hand, that fertility (if not population growth) is moving sharply downward anyway under the socio-economic changes taking place and, on the other hand, that the relative burden of population growth is not unduly heavy - absorbing, say, two percentage points out of a GNP growth rate of 7-8 per cent or more, as in the Republic of Korea or Malaysia. In extreme cases of government population concern (Singapore is the main example) explicit efforts to administer economic disincentives are nevertheless mounted, but more commonly policy action is a good deal less strenuous.

Where, in contrast, economic growth is comparatively slow and population expansion takes a large proportion of it, one evident option for an anti-natalist policy is to ally itself to local government in an effort to use administrative pressures to achieve results. China in the 1970s would be a case in point. The potential problem is that the administrative apparatus thus enlisted in the antinatalist effort may be part of the reason for slow economic growth in the first place. Administrative reforms that are designed to release economic energies may at the same time relax pressures on fertility.

There are, of course, solutions to such difficulties, each with its own social costs. A fine-grained assessment of how local administration in fact operates, with a sensitivity to demographic as well as to economic incentive structures, is the basic requirement for identifying low-cost routes.

Ad hoc, specialized institutional design

In its modern guise local government is a specialized institution. Its concerns may range across provision of primary and secondary education, water supply, enforcement of building codes, and police and fire protection, but in

total the content is quite narrow. Large areas of activity, especially in the economy, lie outside its scope. In earlier stages of development, less is excluded from its concerns - often at some cost (as argued above) to economic performance.

In devising institutional arrangements conducive to a moderating of population growth, there are simple alternatives to all-embracing local authority that nevertheless avoid what are sometimes seen as symmetrically distasteful laissez-faire approaches. These entail the design of specialized institutions (governmental or not) to counter the pronatalist incentives faced by particular groups in the population - groups in the main not defined in terms of residence so that the institution is less at risk of merging with the pre-existing government structure. In rural development, for example, the economic security problems of marginal landholders and landless agricultural workers are properly seen as calling for this kind of attention. Co-operative organization of various kinds is the mainline approach here. The 1976 Asian Agricultural Survey, for example, called for formation of "semi-spontaneous, small, primary organizations operating on the basis of direct participation and serving well defined common interest...[and able to] generate measurable private gains for their participants" (Asian Development Bank, 1978:228-229). A different option, lacking the potential solidarity element but still with important impact on individual and family economic security, is the employment guarantee scheme, the best-known example of which is that of Maharashtra State in India. Enhanced economic security has a plausible downward influence on fertility in many settings (for a strong argument on these lines in the case of employment guarantee schemes, see Cain and Lieberman, 1982).

The risk that new institutions will be added on top of each other, each with its own call on resources, each becoming bureaucratized and generating its own interest groups, creating a mass that works at cross purposes and that is likely to be unaffordable in hard times, clearly exists. This, however, is an argument for a high degree of selectivity in institutional choice and makes it the more important that fertility effects be a consideration in that choice.

Community-level demographic control.

Although community influence on family and individual behaviour is progressively weakened and narrowed over the course of economic development, a residual role for it in the demographic sphere may still be feasible. The possibility mentioned earlier of a community's economic interests being served by a "remittance" strategy, or, if permanent outmigration is significant, the possible need for high fertility in order to maintain population size, provides reasons why fertility control may not be socially favoured at this level. Policy options that seek to internalize part of the social costs of high fertility within small communities as a means of stimulating antinatalist social pressures nevertheless may be appropriate in some settings. (A discussion of such policies is contained in McNicoll, 1975.)

One objection to this policy direction is that it seems to assume a commonality of interest that simply does not exist in many communities. There may, however, still be prospects for generating common interests that in some

domains (women's status might be an example) could override existing division. Interestingly, although community-level policies appear to be most relevant for rural areas, where territorial boundaries have evident meaning, the common interest problem is in some ways more easily addressed in urban settings where communities are generally homogeneous by social class.

Concluding remarks

The implicit model of social development that lies behind most casual discussions of population policy, largely irrespective of ideological orientation, is only slightly caricatured by being described as a transition from village to suburb - an erosion of social controls located in a family's immediate surrounds and their replacement by specialized institutions better able to accommodate the social and geographic mobility and individualism of modern life. Population policy, in this model, works by getting ahead of the game, through activities that marginally accelerate the growth of demand for fertility regulation and that subsidize or otherwise facilitate the meeting of that demand. It is a modest enough role, one that works best when it is least needed. (In loose discourse, or when funding is at stake, modesty is of course less in evidence: population programme routinely lay claim to any fertility declines around.)

It is not surprising that in most countries population policy sticks to a modest list of doables, well separated from basic issues concerned with organizational patterns of development. Less surprising still is that a United Nations declaration on the subject should hew to the familiar pieties of national sovereignty and human rights, and steer clear of the sensitive area of social arrangements in between. It has been argued here that these arrangements make up a large part of the proper arena for policy design and are basic to determining policy effects. In revisiting the World Population Plan of Action, it might do well to accord them more explicit recognition.

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D. Fertility and family planning

International Planned Parenthood Federation

Since the 1974 World Population Conference, significant changes have taken place in approaches to development and population issues. The understanding of the interrelationships between population and development and of the place of family planning in these relationships has greatly increased. These changes will undoubtedly be reflected at the International Conference on Population scheduled for 1984. This paper concentrates on the changes that have implications for fertility trends and for policies and programmes designed to influence these trends as one important aspect of the topic "fertility and family".

POPULATION, DEVELOPMENT AND FAMILY PLANNING

In the early 1970s, there was a tendency to see population and development as mutually exclusive concepts: on the one hand, it was believed that solving population problems was the single greatest priority for development; on the other hand, that development was the only solution to the problems created by rapid population growth.

Although the World Population Plan of Action firmly established the mutual influences of population and development 1/, the situation continued for a period even after Bucharest. International meetings and deliberations on other aspects of development - for example, food, human settlements, employment and international economic order - failed to follow the path paved by the Plan of Action in considering population and development as inextricably linked concepts, and some virtually ignored the Plan of Action. There was little evidence of serious attempts on the part of development planners to include population in development strategies at international or national levels.

In the last few years, however, a new recognition of the interdependence of population and development issues has surfaced. This recognition is exemplified in the Substantial New Programme of Action for the 1980s for the Least Developed Countries which states that "population policies should be considered an integral part of overall development policies ... countries will take appropriate measures for family planning and population control" (Programme, para. 38).

During the same period, the process of development and approaches to achieving it were being reassessed. The record of development efforts had shown that despite enormous strides that were made in many countries in

accomplishing economic growth, the quality of life had not improved for the majority of the population. It was recognized that economic development alone was not enough to improve the quality of life for the individual.

A shift therefore has taken place in the whole conception of the development process. More emphasis is now being placed on its qualitative, rather than purely quantitative, aspects. The focus is on human development - on people, their commitment to development, satisfying their basic needs, and introducing technologies that will minimize damage to existing cultural values.^{2/} The role of people themselves in this new approach to the development process is naturally different.

A vivid illustration of this change was provided by the International Conference on Primary Health Care at Alma Ata, USSR, in 1978. The Declaration resulting from that Conference, while recognizing that Governments had a responsibility for the health of their people, also pointed out that the people "have the right and duty to participate individually and collectively in the planning and implementation of their health care".^{3/} Effective primary health care, the Declaration said, both requires and promotes maximum community self-reliance and participation in its planning, organization, operation and control, making full use of local, national and other available resources.

The concept of people's participation in development has been adopted by almost all Governments around the world and already there are numerous successful experiments with this approach. The theme has also been expanded by a number of international and regional meetings. The message from all these gatherings has been, in short, that community participation and a partnership approach are needed for human development and for family planning.

So far as family planning programmes themselves are concerned, the International Conference on Family Planning in the 1980s, which was held in Jakarta, Indonesia, in 1981, spelled out some of the reasons why community participation is so important, as well as some of the ways to achieve it. The Conference concluded that family planning programmes needed to tailor their services, and the contraceptive methods they offer, to the needs and preferences of the people who use them. Programmes must engage communities more actively in the design and actual provision of information and services. Only in this way can they truly reflect local priorities and be accountable to the people they serve.^{4/}

These changes in approaches to development and in the understanding of its relationship with the population have crucial implications for family planning in both conceptual and programmatic terms. Family planning, as an essential component of development, contributes to it in two, slightly different, ways. The first is its indirect impact on development through its contribution to fertility decline and, consequently, to the slowing down of the rate of growth of population which, in turn, accelerates development.

There is now enough evidence that family planning programmes have had a strong impact on the level of fertility and have helped decrease fertility rates in a number of countries. At the time of Bucharest, some doubts were being expressed that family planning programmes would have a direct effect on fertility. It was argued by some observers that only socio-economic development could bring down fertility and that therefore investment in family planning programmes, for a demographic contribution to development, would be doomed to failure.

We now know that although the most rapid fertility declines take place when the effects of socio-economic development are combined with those of a strong family planning programme,^{5/} significant declines have taken place as a result of family planning programmes even in the absence of substantial socio-economic advancement, such as in China, parts of Indonesia, Northern Thailand and Kerala state in India. We also know that even where the influence of development is present, fertility decline is unlikely to occur without easy access to family planning information and services.

Furthermore, the analyses of the findings of the World Fertility Survey (WFS) show that population growth rates could be reduced by up to 40 per cent if all unwanted births could be prevented. In Bangladesh, for instance, 37.5 per cent of currently married women interviewed said that their last birth was unwanted. If they had been able to prevent these pregnancies, the crude birth rate of the country would have been 25 per 1,000 instead of the current 40 per 1,000 and the natural increase rate would have been 1.3 per cent instead of 2.8. ^{6/}

Family planning contributes to development in a much more direct way too - this concerns its immediate impact on the health of women and children and its contribution to improving the status of women by enabling them to take up educational and employment opportunities. Family planning helps to improve maternal and child health by lowering individual fertility, increasing birth intervals and reducing infant mortality. It is increasingly more widely recognized that women who have no access to family planning information and services are condemned to a life consisting of too many and too frequent pregnancies, to the anaemia, malnutrition and other health difficulties that are intensified by these, to dangerous and illegal abortions and even to an early death. Their children, in turn, are more likely to be malnourished and to fall victim to the lack of adequate care.

The results of a national survey carried out in Bangladesh indicate an abortion rate of 1.9 per 100,000 women aged 10 and over.^{7/} Induced abortion, which is illegal in Bangladesh except to save the life of the mother, has been found responsible for 26 per cent of all pregnancy-related deaths. This means that one fourth of all such deaths every year could be prevented if effective fertility regulation methods were easily available. It has been estimated that 8 out of every 10 abortion-related deaths could be prevented if all abortions were to be performed by using medically safe procedures.

It is hoped therefore that the documentation prepared for the International Conference on Population, including the proposals for modifications to the Plan of Action, will reflect adequately the significance of family planning not only in relation to fertility but also in regard to other aspects of health. For example, the section dealing with recommended action on morbidity and mortality should be expanded to include mention of the well-documented impact of family planning in the reduction of maternal and infant morbidity and mortality. References to morbidity and mortality owing to illegal abortion should be followed up by strong recommendations for action in order to prevent these abortions through the provision of safe and effective methods of contraception.

Increased recognition of the role of population factors in development, on the one hand, and, on the other hand, the place of family planning in family health and well-being have helped to lessen considerably the controversy that formerly surrounded family planning even at the time of Bucharest. Over 120 Governments now give direct and indirect support to family planning as a health measure and, in some cases, as an effective means to bring down the level of fertility as well.^{8/}

The accumulated experience in family planning programmes undertaken by Governments and by private non-governmental organizations makes it easier to focus upon particular issues and problems that are common to many countries. Some of these issues have emerged or have gained importance since Bucharest. Their review and examination as part of preparations for the 1984 Conference are therefore appropriate and necessary.

ACCESS TO FAMILY PLANNING INFORMATION AND SERVICES

As indicated above, there has been a dramatic change in official and public attitudes towards family planning over the past few decades. From a handful in the early 1960s, the number of Governments providing direct or indirect support to family planning has grown to over 120. There are also many private, non-governmental organizations actively involved in the provision of information and services, some for periods much longer than Governments. Despite this welcome expansion in programmes with the aim of increasing the availability of contraceptives, however, millions of people still have little or no access to effective methods of fertility regulation.

The findings of the WFS have confirmed the existence of a serious gap between formal commitments of support to family planning and people's actual access to services. A third of the women interviewed said that their last birth was unwanted. Approximately half the women in developing countries who did not want any more children were not using any effective method of contraception.^{9/} And these were only reflections of the desire to limit family size. We do not have reliable estimates about the scale of need of those who wish to delay or space the births of their children but are unable to do so because of lack of access to education and services. Even in the developed countries, the gap between needs and access often remains.

Those in the greatest need for family planning information and services are usually the least able to have easy access to them. The lack of an effective infrastructure for the provision of health and other basic services to rural areas in most developing countries is a serious handicap to the efforts to establish and extend family planning services to these areas. The extremely rapid rates of urbanization, a phenomenon characterizing many developing countries, has also created a vast sector of the population who may live within half an hour's drive from the government offices, but who lack even the most essential services mainly because of the difficulty involved in expanding these services sufficiently rapidly to catch up with the continuing influx of population.

Finding alternative ways of meeting the needs of people who are not reached by services has therefore a high priority in family planning programmes. The application of the new approach to development, with the participation of the community itself, to family planning programmes holds much promise for the future. In some country programmes, this approach has already been tried with considerable success. An essential component of this kind of service is of course the combination of family planning services with others that the community sees as its priority needs.^{10/}

THE ISSUE OF THE HUMAN RIGHT TO FAMILY PLANNING

This continuing lack of access to fertility regulation services and supplies means, in effect, that the basic human right to family planning, a right that was internationally recognized almost 20 years ago and strongly reaffirmed in the World Population Plan of Action, has not become a reality for millions of people. In many cases, this is because the means to exercise this right are simply not available. In other cases, however, it results from official restrictions.

Studies by the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat and the International Planned Parenthood Federation (IPPF) show that in at least 12 countries there are measures to restrict access to family planning.^{12/ 13/} In most, these restrictions have been imposed for demographic reasons, because the current level of fertility is considered too low, although other factors, such as religious or moral objections to family planning, may also be influential.

In addition to the restrictions on overall access to family planning, some countries restrict access to particular groups in the population. The unmarried or the young, for instance, may find services are denied them even in countries with extensive fertility regulation services.

There may also be restrictions on certain methods: these are sometimes based on quite legitimate safety concerns or other reasons related to social and cultural values, and it is not useful to make generalizations about them.

Instead, efforts should be made to overcome these problems by improving the safety of these methods and by identifying methods and ways of delivery that are most likely to conform with existing perceptions and customs. There is also a need to improve the capacity of individual countries to make responsible decisions on contraceptive safety and effectiveness.

Sadly, it is also true that an unfortunate politicization of what should be a purely scientific issue has emerged recently, regarding the provision of some contraceptives, particularly Depo-Provera. Although the safety of this drug has been found to be comparable to, or even greater than, that of other contraceptives widely in use by over 70 Governments in the developed and developing world alike, and by major international scientific bodies attached to WHO and IPPF, its provision in national programmes and its supply internationally have created much controversy. The unfortunate result of this controversy is that some Governments have become reluctant to include this contraceptive in their programmes despite its very high acceptability to the people and the numerous advantages in its provision and use. Recently, a major donor Government in a country where Depo-Provera is approved for contraceptive use has decided not to provide this drug as part of its aid to family planning programmes, even to Governments that approve the drug for use in their countries and that request it. This decision has obviously been taken in order to avoid any political controversy.

The net result of such actions is that a great many people are denied access to a contraceptive which is medically safe and culturally acceptable and which might have been their first choice for fertility regulation. It is time that family planning should be de-politicized and that decisions on which contraceptives should be provided are made on the basis of easily available scientific information and as objective judgements, allowing recipient countries to have the major influence on the products used in their own programmes.

As more countries in the developed world experience continuing low or declining fertility, which brings their population growth to around or even below zero, there has been a growing tendency to introduce incentives designed to increase family size. Central and Eastern European countries were among the first to establish such measures but now some Western European countries have also introduced similar schemes. Added to these are some developing countries Governments which perceive their populations as being too small or the rate of population growth too slow. In all, some 20 Governments now operate incentive schemes designed to raise family size.^{14/} Although most measures take the form of an extension of existing social policies and therefore do not appear to pose an immediate threat to the right to decide the number and spacing of children, they nevertheless have been questioned on the principle of individual freedom of choice in making decisions regarding fertility.

Conversely, more than 20 Governments who perceive population growth rates as too high have introduced economic and other measures to restrict family size, sometimes combined with organized social pressure on couples to have a

limited family. Some of these measures, particularly those that may curtail some social benefits on the basis of family size, and cash payments to acceptors of certain fertility regulation methods, have been criticized because they are seen as an infringement of the basic human right to decide the number and spacing of children.

This increasing trend towards direct government intervention in decision-making about individual fertility cannot be ignored. Precisely because Governments have seen the interrelationships between population and development, they have come to accept also the possibilities of government intervention to affect growth rates. The United Nations inquiries into Governments' perceptions of population growth trends and their policies to influence them show that, by 1980, 59 Governments indicated that the current fertility rate in their country was too high and 38 of these had already adopted policies to reduce this rate. In contrast, 22 Governments found the fertility rate in their countries too low and 17 had policies designed to increase it. As Governments come to intervene in fertility, more and more are likely to experiment with a range of methods for doing so, including incentives, disincentives and restrictions on access to services.

The issues involved are complex ones. As there is more recognition of the role of population in development, and of fertility control as a means of population planning, the ethical and practical considerations that emerge pose increasingly urgent questions. There has been little discussion, and less agreement, internationally, of the rights of individuals and families and those of the State; or of the duties of individuals and families and those of the State.

It is probably appropriate that no attempt has been made to establish universal yardsticks for ethical acceptability of incentive and disincentive measures. As the International Conference for Family Planning in the 1980s concluded, the use of incentives and disincentives involve complex ethical, social and political issues which "preclude international generalisations". The Conference called for caution in introducing these schemes and particularly frowned upon cash incentives to clients and providers for the acceptance of some methods "because they tend to distort the user's perspective and may lead to abuse".^{15/}

The WPPA takes as one of its principles (para. 14(f)) the basic right of individuals and couples to decide freely and responsibly the number and spacing of their children. In the same principle, it explains this concept of responsibility as taking into account, in the exercise of this right, the needs of living and future children and individuals' responsibility towards their communities.

-----This may still be the most appropriate stand to take in a document such as the World Population Plan of Action which has international application and which cannot impose a universal standard for determining the exact point where a balance should be established between rights and responsibilities in individual countries. Nevertheless, in view of the increasing significance of

the use of incentives and disincentives for pronatalist or antinatalist purposes, more careful review and clarification of this matter than that provided in paragraph 34 of the WPPA seems necessary.

On the fundamental question of the basic right to family planning, however, there can be no compromise. The WPPA may need to be more consistent and more firm on this principle and avoid the use of such phrases as "when appropriate" when referring to the provision of family planning services. Such qualifications contradict the principle stated in paragraph 14(f). If the knowledge of and access to family planning is a basic human right, such services must always be appropriate.

ADOLESCENT SEXUALITY

Young people below the age of 25 make up nearly half the world's 4.5 billion inhabitants. The young population of the developing regions will double between 1975 and the year 2000, and the family formation patterns of these young people will determine the world's population during the next 20 years and beyond.

The gradual but welcome rise in the age at marriage in many countries offers new opportunities for women, as well as protecting some of them from physically and psychologically detrimental effects of early pregnancy and childbirth. However, in Africa for example, 40 per cent of girls aged between 15 and 19 are married. Most of them have several children even before they reach the age of 20. ^{16/} Unfortunately, this situation is paralleled in many places by a growth in premarital pregnancy, which is socially more damaging and sometimes physically as well.

In the United States of America, more than 1 in 10 adolescents become pregnant each year and half the premarital teenage pregnancies occur within the first six months after the initiation of first sexual activity.^{17/} But this is not a problem confined to developed countries alone. In one hospital in Kenya, almost half those admitted for problems arising from illegal abortion were aged between 14 and 20. ^{18/}

Educational programmes for young people, and services designed to meet their needs, are now a priority,. Young people too have the right to such education and to access to services; they too need to understand the demographic as well as the personal implications of their fertility behaviour. The WPPA's recommendations in this vital area, which contain a brief recognition (paragraph 64) of the effect of the increasing numbers and proportion of young people in the populations of developing countries, would benefit from expansion.

CONTRACEPTIVE TECHNOLOGY

It is already clear that the present generation of contraceptives is far from perfect. With increasingly widespread use of these methods and with increasing knowledge of their potential side-effects, the chorus of demand for improved contraception grows. Yet, research into new methods, which has never been a major priority in the scientific community, has declined considerably over the past few years. The total world budget for contraceptive research and development is, in real terms, now below that it was 10 years ago.

Funding for all aspects of reproductive and contraceptive research rose rapidly from an estimated US\$ 31 million in 1965 to US\$ 117 million in 1973. 19/

Although, in current dollars, the total has continued to climb, when figures are corrected for inflation, total expenditure by 1981 was lower than it had been in 1971. 20/

The pharmaceutical industry, faced with high cost research over a long time-scale, and with the growth of aggressive and sometimes ill-advised consumer pressure, has almost abandoned investment in contraceptive research. The United States industry, for instance, which accounted for about a quarter of all reproductive research in the late 1950s, by the late 1970s, was believed to have been responsible for less than one tenth of expenditure. 21/ A mere half dozen Governments support bilateral research efforts of the WHO of research into human reproduction. It is unlikely now that there could be any significant breakthrough in contraception on the market until after the year 2000.

A great deal also needs to be done to improve the acceptability and effectiveness of the existing methods. Promising work is being undertaken by various institutions, mainly in the developed world, to introduce improved versions of existing methods such as intrauterine device (IUD) and barriers. However, it is likely to take a long time before such improvements are introduced for large-scale use. Although more effective, some of the improved methods, such as copper IUDs, may also be too costly to be provided on a subsidized basis in large government programmes in developing countries.

Increasing acceptance of family planning, coupled with the rapid growth of population in the fertile age groups which will continue for some time in the future, makes it necessary for a careful examination to be made of future needs for contraceptive supplies and of the extent to which this need can be met by existing sources of supply. The feasibility, advantages and disadvantages of local manufacturing of contraceptives has been subject to some studies, but more detailed analyses, particularly in terms of future needs, are also required. Improvement of the systems of supply and distribution of contraceptives at both international and national levels is an additional priority. Many programmes and, more importantly, users, frequently face difficulties caused by disruptions in supply lines.

RESOURCE AVAILABILITY

The expansion and improvement of family planning programmes in order that they can meet the existing unmet need as well as cater to the additional needs that will be created by the growing numbers of people entering the reproductive ages, require a substantial increase in both financial and other resources. In many countries, national allocations to family planning programmes and services from Governments' own budgets have been growing steadily. Data collected by The Population Council show that in 15 countries, an average of 67 per cent of total expenditure for family planning is met by the Governments themselves and only one third comes from external aid. 22/

This is a most welcome trend. However, the amount of financial resources in absolute terms is still woefully inadequate, especially when compared with the need. An estimate of funding for family planning by developing countries suggests that it is running at the level of one half of 1 per cent of the overall national budgets. 23/ In many countries, there are numerous other urgent needs and very serious economic problems. The global economic prospects do not hold much promise for the immediate future for countries with a great many pressing development problems and substantial foreign debts.

International population assistance has not been increasing at a level commensurate with existing and future needs. Aid for population and family planning programmes from bilateral and multilateral sources has increased dramatically from US\$ 2 million in 1960 to US\$ 167 million in 1979, excluding double counting. 24/ But when adjusted to take into account inflation, the increase between 1971 and 1979 was only about US\$ 80 million during a period when the number of programmes requiring assistance increased rapidly. Furthermore, there has been a decline in this assistance, in real terms, during the past few years. Latest estimates show that in 1981, international resources allocated to population and family planning increased by a mere 5 per cent - not even sufficient to keep up with inflation.

There has also been a decline in terms of population aid as a proportion of development assistance. The proportion of development aid going to population, including family planning, rose from less than 1 per cent in 1960 to 2.5 per cent in 1971. But it has now declined to around 2 per cent.

This inadequate level of international assistance, combined with all other problems associated with it - such as short periods of commitment, delays in disbursement, accounting, reporting and other requirements for the release of funds and their effective management within recipient countries - make programme development and expansion difficult, especially in the current period of international recession.

All this comes at a time when the need for external assistance for population and family planning is likely to continue for at least another decade or two. In many parts of the world, particularly in Africa, programmes are only now being established. They are in the early stages of development when a great deal of support from international sources is necessary.

A recommendation contained in the World Population Plan of Action for a

specific target for the allocation of resources on the part of the international community as well as by Governments would considerably strengthen its impact. The International Conference on Family Planning in the 1980s suggested that developing countries allocate for family planning 5 per cent of domestic expenditure, and that international support for population and family planning should be increased to at least 5 per cent of development assistance. The Conference called for an overall allocation of US\$ 3 billion annually from national and international sources. 25/

Resource availability is crucial to the strengthening of the WPPA because the fulfilment of any priorities given to the kind of issues discussed in this paper depends on a realistic allocation of resources for population and family planning activities carried out by both governmental and non-governmental organizations.

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E. Operational responses to the World Population Plan of Action in programmes of the UNFPA in the areas of fertility, family and family planning

United Nations Fund for Population Activities

INTRODUCTION

The United Nations Fund for Population Activities (UNFPA) has grown rapidly since becoming operational in 1969. The cumulative programme expenditures for the period 1969-1982 were \$ 785.0 million. At the end of 1981, cumulative pledges from both developed and developing countries totalled \$ 848.1 million. The remarkable growth in UNFPA resources, however, has been more than matched by the rise in demand for assistance, particularly following the World Population Conference in 1974.

The World Population Plan of Action, adopted by a consensus of 135 States at the United Nations World Population Conference of 1974, is of special importance to the work of UNFPA. While a large number of developing countries have gained great experience in population activities since the adoption of the Plan, the Plan continues to be a valid guide for development and implementation of population activities.

This paper reviews briefly the experience of UNFPA-supported programmes related to family, fertility and family planning in developing countries through an analysis of recommendations of the Plan of Action and corresponding UNFPA programmes. The paper also identifies some programme areas that need emphasis in the further implementation of the recommendations of the Plan.

WORLD POPULATION PLAN OF ACTION AND UNFPA-SUPPORTED PROGRAMMES

Recommendations of the Plan of Action

Among the many recommendations and guidelines of the World Population Plan of Action, those dealing with the protection of the family (paras. 14 (g), 39 and 43), with the improvement of the status of women (paras. 14 (h), 32 (b) and 41), with modernization and fertility (para. 32), and with the right of individuals and couples to plan their families (paras. 14 (f), 28, 29, 33 and 34) are of special importance to family and fertility.

The Plan of Action recognizes the family as the basic unit of society and recommends that Governments enact legislation and policy to protect the family, and conduct periodic reviews of national legislation with direct bearing on the family and its members, such as age at marriage, inheritance and divorce.

The Plan urges Governments to ensure full participation of women in the educational, social, economic and political life of their countries on an equal basis with men and recommends that "women should be actively involved both as individuals and through political and non-governmental organizations, at every stage and at every level in the planning and implementation of development programmes, including population policies".

The Plan acknowledges that fertility and development are closely interrelated and perceives that the following development goals generally have a moderating influence on fertility: first, the reduction of infant and child mortality, particularly by means of maternal and child health care; second, the full integration of women into the development process, particularly by means of greater participation in educational, social, economic and political opportunities; third, the promotion of social justice; fourth, the promotion of wide educational opportunities; fifth, the elimination of child labour; and lastly, the establishment of an appropriate lower limit for age at marriage.

The Plan of Action, recognizing the existence of a variety of national goals does not recommend any norms for family size. However, the Plan invites countries that consider their birth rates detrimental to their national purposes to consider setting goals and policies to be attained by 1985. The Plan recommends that all countries respect and ensure, regardless of their overall demographic goals, the right of persons to determine, in a free, informed and responsible manner, the number and spacing of their children.

The role of family planning in achieving fertility goals is also clearly noted in the Plan of Action, which recommends that countries should encourage appropriate education concerning responsible parenthood and should make available to persons who so desire, advice and the means of family planning. Furthermore, the Plan calls for a broad approach to family planning, including the elimination of involuntary sterility, and invites Governments that have family planning programmes to consider integrating and co-ordinating those services with health and other services.

UNFPA programmes in fertility family and family planning

With the rapid growth in demand for population assistance, especially after the 1974 World Population Conference, and with the accumulation of experience during the last decade, the Fund has rapidly moved from its original projects approach to a programme approach comprising a set of complementary population activities. More recently a needs assessment approach has been adopted, by which a country's population and development requirements and strategies to meet them are assessed, and recommendations are made for action and assistance. By the end of 1982, UNFPA had completed 70 needs assessments.

During the period 1969-1981, the Fund supported a total of 1,240 projects on family, fertility and family planning in 92 countries, of which 31 are in sub-Saharan Africa, 24 in Asia and the Pacific, 25 in Latin America and the

Caribbean, and 12 in the Middle East and Mediterranean. This totals about \$ 394 million, 50.2 per cent of total programme resources, or 64 per cent of total assistance to country activities.

UNFPA has supported both research and action programmes related to the family. It has provided assistance for research on aspects of family demography including age at marriage, customs relating to marriage, birth spacing, desired and achieved family size, as well as family formation and dissolution. The Fund has assisted a number of action projects concerning family life education, better family living and family welfare education in a number of countries, including Cameroon, Indonesia, Ivory Coast, Jamaica, Kenya, Malaysia, Mali, Swaziland, Syrian Arab Republic, Uganda and Zambia. It is expected that these action programmes will help families to make better plans and decisions about various aspects of life including birth spacing.

The Fund has supported a number of activities designed to improve women's position in the family, in community and public life and to accelerate their involvement in national population and development efforts. Illustrative country examples include Chile, Egypt and Sri Lanka.

In line with recommendations of the World Population Plan of Action, the Fund has supported a number of activities directed towards a better understanding of fertility. The Fund assisted the World Fertility Survey (WFS) programme in 22 countries. A number of policy research studies on the relationships between fertility and family organization, the level of mortality, and other factors such as health, literacy, education and occupation have been assisted, for instance, in Colombia, Egypt, Indonesia, Jordan, the Republic of Korea and the United Republic of Tanzania.

Many UNFPA activities touch upon the reduction of infant, child and maternal mortality and the improvement of the role and status of women. The Fund supports action programmes to strengthen maternal-child health facilities and efforts to make available information and services to plan and space births. Such activities have been supported, for example, in Bhutan, Chile, Gambia, Malawi, Malaysia, Mozambique, Nepal, Panama, Sierra Leone, Somalia and the Syrian Arab Republic.

The Plan of Action clearly recognizes the need for the establishment of population units at a high level of the national administrative structure (para. 95) to integrate population measures and programmes into comprehensive social and economic plans and programmes. The Fund addresses this issue through its strategy of assisting the development and strengthening of national population commissions, population units, councils and committees, which are sometimes within national development planning structures, or are autonomous bodies, for instance in Egypt, El Salvador, Honduras, Jordan, Kenya, Mexico, the Philippines, Republic of Korea, Rwanda, Senegal and the Syrian Arab Republic.

The recommendations contained in the Plan of Action concerning family planning are both extensive and far-reaching. The Fund takes family planning to include those practices that help individuals or couples to avoid unwanted

births, to bring about wanted births, to control the timing of births and to determine the number of children in a family. Family planning information, services and supplies, education about sex and responsible parenthood, and the diagnosis and treatment of infertility make the attainment of these objectives possible.

Recognizing the differing needs of countries for the provision of family planning services, the Fund supports such activities as a human right, for the improvement of family health, for demographic change, or as an adjunct to socio-economic development, singly or collectively. UNFPA supports all effective means of the delivery of family planning services and the provision of all methods of fertility regulation technically approved by the World Health Organization (WHO), in accordance with the policies of requesting Governments. The provision of services may be undertaken as vertical family planning or as integrated programmes. Family planning may be integrated with maternal and child health care in the context of primary health care, or with other socio-economic development programmes.

The Fund supports a broad spectrum of activities in family planning. The most important are education and communication programmes; activities to strengthen service delivery and to expand population coverage; programme management and evaluation; operational, behavioural and clinical research; training of medical, paramedical and non-medical personnel; and research on contraceptive technology. Such a large number of projects has been supported in the family planning sector that descriptive analysis of these projects is not attempted here.

The Fund has collaborated with a large number of intergovernmental organizations in the implementation of family and fertility programmes. They include the International Labour Organisation (ILO), WHO, the United Nations Children's Fund (UNICEF), United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Development Programme (UNDP). Several non-governmental organizations including the International Planned Parenthood Federation (IPPF), the International Committee on Management of Population Programmes (ICOMP), the Programme for the Introduction and Adaptation of Contraceptive Technology (PIACT) and the Japanese Organization for International Co-operation in Family Planning (JOICFP) have been actively co-operating with UNFPA.

UNFPA EXPERIENCES AND FINDINGS

Developments in the population field were most impressive during the 1970s. Not only was there a rapid increase in the number of countries formulating population policies and programmes, but there was also a clear tendency towards diversification of population activities. While international technical co-operation activities have been helpful, national efforts have been even more important. Collaboration between UNFPA and individual countries has led to changes in ways of thinking about population and to experiences that have implications for the future.

The most important finding, perhaps, relates to the perception of the many dimensions of the population problem. Concern with population is not merely with growth, but with distribution, composition and quality and their implications for development. Although population growth continues to be considered important in many countries, reductions in population growth are viewed not as ends in themselves, but as efforts to reduce imbalances between demographic pressures, on the one hand, and development potential in individual countries, on the other. Along with this goes the idea that population is a vital component in the whole spectrum of development planning.

During the Fund's 13 years, a great deal has been learned about initiating and managing population projects in the context of development planning, as the Fund has provided assistance for basic data collection, population research, policy formulation and evaluation, family planning programmes, education and communication and multisectorial programmes in a large number of developing countries. The involvement of the United Nations has legitimized national population activities, has stimulated national investment in and commitment to population, and has made countries more willing to accept United Nations assessments of national achievements in population activities.

UNFPA is pledged to respect national, local and individual values, and never to attempt to impose any philosophy that runs counter to them. Consequently, the Fund has been able to help some 141 countries and territories, in all parts of the world, of all shades of political and religious beliefs and at all stages of development.

The significant role of fertility regulation in modifying population growth is well recognized in many countries; if the policy is in tune with the needs and aspirations of the people, and if it is promoted in a manner in accordance with religious belief and sensitive to cultural values, it is generally successful.

Family planning programmes are acceptable even in situations of high mortality and low demographic development if they are integrated with maternal and child health. For example, five years ago, there were only 11 countries in all of sub-Saharan Africa receiving assistance to establish or strengthen their maternal and child health and family planning services. There are now 31 countries in sub-Saharan Africa and eight in West Africa alone with maternal and child health and family planning service projects.

Family planning can succeed only if it is accepted freely. Only with the participation of the community can the message and practice of family planning be widely spread. Similarly, experience has shown that family planning cannot be promoted in developing countries on the mere argument that it is of economic benefit to the individual in the short-term or that it is useful to the country in the long-term. Arguments that reinforce personal long-term values concerning welfare benefits, better health and reduced demand for family needs have had a better chance of acceptance.

Community-based contraceptive distribution programmes in a number of countries, including Mauritius, Mexico, Nigeria, Panama, Sri Lanka and Thailand, have been found to be effective. Projects involving the community and its leaders in the planning and implementation of family planning programmes in a number of countries, including Ecuador, Indonesia, Nigeria and Thailand, have been generally successful.

Self-sufficiency in contraceptive supplies is vital to the continued success of national family planning programmes. In order to help achieve it, UNFPA has given support to local formulation and manufacture, and this has become an important part of programmes, for example in China, Egypt, India, Indonesia and Pakistan.

Population education has helped to strengthen the family and to deal with such family issues as wise use of family resources, communication between parents and adolescents, and how to meet the nutritional needs of low-income mothers and young children.

Family planning programmes often reach couples only after they have had several children, and thus cannot give them the health benefits of child-spacing. The introduction of the idea of responsible parenthood to boys and girls before they reach the age of reproduction can bring important benefits in the future.

Population education in schools, besides making a direct contribution to development and an indirect contribution to the family, family planning and fertility decline, is having a positive impact on educational systems by encouraging the development of investigation, critical analysis and problem-solving skills in children.

Research still has not clearly identified all the determinants of fertility decline. Experience shows that besides health, education, income and status of women in society, an important factor influencing the decision to plan families appears to be equity in the distribution of social services and of opportunities. This seems to be true in the cases of China, Sri Lanka and the State of Kerala in India and others.

AREAS NEEDING FURTHER ACTION

Much progress has been achieved since 1974 towards a better understanding of the interrelated phenomena of family fertility and family planning. At the same time, it has been realized that population activities are programmable as are activities in other development sectors. There is still a need, however, to resolve several issues in family, fertility and population policy. The following issues particularly need further action in the implementation of the World Population Plan of Action.

There is an urgent need to formalize national commitment to fertility, family and related population activities. Countries with population goals and targets should be urged to review and revise them, as appropriate, and

countries that do not yet have established goals and targets should be urged to develop them soon. Population activities need to be better integrated and co-ordinated with other development efforts at the country level for reasons both of cost-effectiveness and of synergistic impacts. It will therefore be necessary for national Governments to formulate comprehensive population policies and programmes taking into consideration both short-term priorities and long-term consequences. Continued attention needs to be paid to manpower development, training and institutional strengthening. In some regions, the lack of manpower and training remains severe.

To improve the link between population and development activities, greater efforts should be made to involve women in the design, implementation and management of population and family planning projects. Such projects should be responsive to women's needs, situation and concerns and to promote their role as decision-makers. Increased attention should be given to women's organizations at the community level, such as mothers' clubs, women's co-operatives and other community organizations.

Breast-feeding has a very vital role to play in the improvement of infant and child health and of child-spacing, and it is often overlooked in population programmes. Increased attention should be given to promoting it as well as to the supplemental feeding that is becoming popular.

There is a need for greater efforts to deliver family planning information and services to those who wish to regulate their fertility, particularly among the poorest people, and also among those men and women in rural and hard-to-reach areas. Support should be provided for the development of innovative methods of delivery of services through maternal and child health/family planning (MCH/FP) programmes, primary health-care systems and community-based programmes. In general, there is an urgent need to improve family planning services.

The experience gained in a number of countries in the past and the need for involvement of the community in the future necessitates that a high priority be given management skills, the development of decentralized organizational structures and the evaluation of programmes.

In view of the need to spread family planning messages and information among the hard to convince in developing countries, new strategies on information, education, motivation and communication have to be developed with particular emphasis on problem-solving and issue-oriented approaches.

Although substantial progress has been achieved in the field of contraceptive development, available contraceptives are not altogether satisfactory, especially for use in developing countries. Efforts must be strengthened to meet the needs of developing countries for safe, inexpensive, effective and acceptable contraceptives for both men and women. This must involve strengthening of research and technical capabilities in developing countries to promote self-reliance.

It is generally recognized that family structures influence individual and collective reproductive behaviour. It would be useful to have a better understanding of the mechanisms through which changing reproductive behaviour affects family organization, the values assigned to roles within the family and the equal value of male and female children. Specific country studies addressing these questions will be necessary if policy-oriented action is to be taken at the country level.

Our understanding of the determinants of family-size norms, their consequences and their influence on fertility and contraceptive behaviour is inadequate. Operationally-oriented research on these aspects is a matter of high priority.

While considerable progress has been achieved in our understanding of levels and differentials in fertility through national population censuses and international surveys like the WFS, periodic intercensal surveys of population to assess trends in demographic behaviour and the impact of population policies and programmes need to be undertaken regularly.

In spite of an impressive number of research studies on fertility behaviour, there is a need for a policy-oriented analysis of fertility decline. A sectoral model of fertility that would take into account both socio-economic and biological determinants of fertility also needs to be developed soon. This should greatly help both the formulation of appropriate population policies and programmes and the methodology of making population projections in the developing countries.

In view of the increased interest in natural family planning as a method of fertility regulation, there is an urgent need to collect data on the subject, to develop and improve research instruments, to monitor and measure prevalence and effectiveness, to train natural family planning teachers and to develop teaching materials.

Annex I

ILLUSTRATIVE LIST OF UNFPA-ASSISTED PROJECTS IN THE AREA OF
FERTILITY, FAMILY AND FAMILY PLANNING a/

Region/major activity	Project symbol and title		Status
<u>Africa (Sub-Saharan)</u>			
<u>Training, research and analysis</u>			
Ivory Coast	IVC-77-PO1	Training of family life educators	
Kenya	KEN-74-PO6	Research and training on cultural values and population policy	Completed
Lesotho	LES-76-PO1	Fertility survey	
Mali	MLI-77-PO3	Utilization of VTR for family life education and women's promotion	
Mauritania	MAU-80-PO2	National fertility survey of Mauritania	
Mauritius	MAR-79-PO1	Role of women in improving family living	

a/ This list includes only those projects that deal either totally or to a substantial extent with fertility, family and family planning activities. The list, however, does not include all UNFPA-supported maternal and child health/family planning (MCH/FP) projects.

Region/major activity		Project symbol and title	Status
<u>Africa (Sub-Saharan) (cont'd)</u>			
Nigeria	NIR-70-P03	Sociology demography institute of child health	Completed
Nigeria	NIR-80-P01	National fertility survey of Nigeria	
Senegal	SEN-77-P02	Fertility survey	
United Republic of Tanzania	URT-74-P01	Training of field workers	Completed
Upper Volta	UPV-79-P03	Study of traditional beliefs as basis for population policy	
Upper Volta	UPV-79-P10	Revision of the national family code	
Zambia	ZAM-76-P03	Labour and family welfare education in the organized sector	
Regional	RAF-70-P08	Technical meeting on pilot studies on fertility, infant mortality and evaluation of population programmes	Completed
<u>Action programmes and awareness creation</u>			
Botswana	BOT-75-P01	Assistance to national family planning programme	
Cameroon	CMR-72-P02	Women's Seminar in Cameroon-- planning for better family living	Completed
Congo	PRC-73-P02	Promotion feminine et familiale dans la region du pool et du plateau kowlouya	

Region/major activity	Project symbol and title	Status	
<u>Africa (Sub-Saharan) (cont'd)</u>			
<u>Action programmes and awareness creation (cont'd)</u>			
Gabon	GAB-79-P01	Co-operative development and implementation of family welfare through co-operatives	
Gambia	GAM-77-P01	Development of communication and extension support services for maternal and child health and family welfare activities	
Gambia	GAM-79-P01	Improvement of maternal and child health and family welfare services in rural areas	
Ghana	GHA-75-P05	Assistance to the Ghana family planning programme - production of oral contraceptives	
Ivory Coast	IVC-76-P02	Family life education	Completed
Kenya	KEN-74-P02	Programme for better family living	Completed
Lesotho	LES-74-P07	Expansion and upgrading of rural health clinics	
Liberia	LIR-78-P01	Development of health services - MCH/FP Bong County	
Malawi	MLW-78-P03	Development of a comprehensive maternal and child health programme	
Mali	MLI-77-P02	Family education in co-operatives	
Mozambique	MOZ-78-P01	Development of national family planning programme	
Sierra Leone	SIL-77-P02	Fertility advisory services/ family health project	

Region/major activity	Project symbol and title	Status	
<u>Africa (Sub-Saharan) (cont'd)</u>			
<u>Action programmes and awareness creation (cont'd)</u>			
Swaziland	SWA-75-P02	Planning for better family living project	
Uganda	UGA-76-P01	Planning for better family living	
United Rep. of Tanzania	URT-77-P01	Population and family life education, communication and applied research to integrated rural development	
Zambia	ZAM-79-P02	Programme for better family living in Zambia	
Regional	RAF-77-P05	Support for family and development	
<u>Asia and the Pacific</u>			
<u>Training, research and analysis</u>			
Burma	BUR-77-P02	Fertility survey	
China	CPR-80-P02	Training centres for family planning personnel	
Fiji	FIJ-78-P03	Family welfare and non-formal adult education	
India	IND-74-P08	Research and training on cultural values and population programmes	Completed
India	IND-78-P02	Training of DAIS	Completed
Malaysia	MAL-79-P04	Study of marriage	
Malaysia	MAL-79-P05	Strengthening of staff development and training for family health, family planning and health education	

Region/major activity	Project symbol and title	Status
<u>Asia and the Pacific (cont'd)</u>		
<u>Training, research and analysis (cont'd)</u>		
Pakistan	PAK-74-P14	Pakistan fertility survey
Philippines	PHI-71-P02	Study of relationship between family size and health of family members
Philippines	PHI-74-P01	Research and training on cultural values and population programme
Republic of Korea	ROK-74-P04	Korean national fertility survey
Republic of Korea	ROK-74-P10	Economic factors and fertility
Republic of Korea	ROK-77-P03	Evaluative survey on women in family planning and related programmes
Thailand	THA-74-P02	Fertility survey
Thailand	THA-78-P12	Training and follow-up support of peripheral and primary health care workers
Regional	RAS-79-P12	Planned parenthood and rural women's advancement
<u>Action programmes and awareness creation</u>		
Bangladesh	BGD-74-P04	Pilot project for family planning motivation and services in industry and plantations
Bangladesh	BGD-77-P02	IUD clinical trial at model clinic
Bangladesh	BGD-78-P04	Rural fertility and female economic activity in Bangladesh

Region/major activity	Project symbol and title		Status
<u>Asia and the Pacific (cont'd)</u>			
<u>Action programmes and awareness creation (cont'd)</u>			
Bhutan	BHU-79-P01	Development and strengthening of MCH & FP services	
China	CPR-80-P06	Expansion of service and research for maternal and perinatal care	
India	IND-71-P02	Health education in schools including family life education	Completed
India	IND-74-P14	Establishment of documentation centre in family planning at the National Institute of Family Planning	
India	IND-78-P05	Measures to reduce infant and maternal mortality in promotion of small family norm	
India	IND-80-P04	Family welfare education in plantation	Completed
Indonesia	INS-77-P07	Population family life education for workers	Completed
Indonesia	INS-79-P20	Women participation	
Kiribati	KIR-81-P01	Responsible parenthood and national family planning	
Malaysia	MAL-79-P03	Family life through family development programme	
Malaysia	MAL-79-P06	Development of MCH/FP project	
Nepal	NEP-80-P01	Strengthening the integrated community health project in the ministry of health at the central level	

Region/major activity	Project symbol and title	Status
<u>Asia and the Pacific (cont'd)</u>		
<u>Action programmes and awareness creation (cont'd)</u>		
Nepal	NEP-80-P13 Assistance to FP/MCH project	Completed
Pakistan	PAK-74-P02 Field motivators	Completed
Pakistan	PAK-77-P06 Family planning services through Hakeems	
Pakistan	PAK-79-P03 Pakistan national endoscopy, surgical contraception and reproduction health education programme	
Philippines	PHI-70-P03 Responsible parenthood project	Completed
Republic of Korea	ROK-77-P02 Institutional support for STAFF development programme at KIFP	
Republic of Korea	ROK-77-P12 Upgrading of in-plant clinics for family planning	
Sri Lanka	SRL-77-P03 Community motivation for family planning	
Tuvalu	TUV-78-P02 Family welfare education through women's committees	
Regional	RAS-72-P44 Seminar on family life education in schools, South Pacific	Completed

Region/major activity	Project symbol and title		Status
<u>Latin America and the Caribbean</u>			
<u>Training, research and analysis</u>			
Antigua	ANT-78-P01	Youth involvement in family life education	
Chile	CHI-77-P01	National fertility survey	
Chile	CHI-78-P02	Training of women for the improvement of family life and aid to minors	Completed
Costa Rica	COS-76-P01	Costa Rica fertility survey	
Dominican Republic	DOM-74-P01	Dominican fertility survey	
Dominican Republic	DOM-75-P01	Study of cultural values and population policy, the Dominican Republic	Completed
Ecuador	ECU-78-P02	National fertility survey	
Guyana	GUY-74-P01	Fertility survey	
Haiti	HAI-76-P01	Fertility survey	
Jamaica	JAM-74-P03	Advanced training programme and research in fertility management	Completed
Jamaica	JAM-74-P04	Fertility survey	
Mexico	MEX-74-P01	Research and training on cultural values and population policy	Completed
Mexico	MEX-75-P01	Mexican fertility survey	
Peru	PER-76-P01	National fertility survey	
Trinidad and Tobago	TRI-76-P03	National fertility survey	
Regional	RLA-78-P27	Appropriate technologies in health and family education	Completed

Region/major activity	Project symbol and title	Status
<u>Latin America and the Caribbean</u>		
<u>Action programmes and awareness creation</u>		
Chile	CHI-72-P02	Extension, maternal, child and family welfare services
Cuba	CUB-79-P04	Maternal and child health and family planning services
Ecuador	ECU-80-P05	MCH & FP
Grenada	GRN-77-P01	Youth involvement in family life education and services
Guatemala	GUA-79-P08	Population and family life education through training of agricultural home improvement promoters
Honduras	HON-77-P01	MCH/FP programme
Jamaica	JAM-72-P02	Education for family living programme
Panama	PAN-78-P02	Extension of MCH/FP programme
Paraguay	PAR-79-P10	Family life education/ population education
Saint Kitts-Nevis-Anguila	STK-77-P01	Youth involvement in family life education

Region/major activity	Project symbol and title		Status
<u>Latin America and the Caribbean (cont'd)</u>			
<u>Action programmes</u> <u>and awareness creation (cont'd)</u>			
Regional	RLA-78-P20	Family life education	Completed
Regional	RLA-78-P26	Population and nutrition	Completed
Regional	RLA-78-P28	Inter-agency meeting on family life education in the Caribbean	Completed
Regional	RLA-79-P11	Workshop on female labour and family in Latin America	Completed
<u>Middle East and Mediterranean</u>			
<u>Training, research and analysis</u>			
Egypt	EGY-74-P21	Research and training on cultural values and population policy	Completed
Egypt	EGY-78-P01	Egyptian Fertility Survey	Completed
Egypt	EGY-79-P04	Workshop on child health in Egypt	Completed
Jordan	JOR-75-P01	Jordan Fertility Survey	
Syrian Arab Republic	SYR-77-P01	Fertility survey	
Turkey	TUR-76-P02	Fertility survey	
Regional	RMI-73-P13	Near East seminar on the role of families in dealing with population problems in rural areas	Completed

Region/major activity	Project symbol and title	Status
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Middle East and Mediterranean (cont'd)

Action Programmes and
Awareness Creation

Democratic Yemen	PDY-79-P07	In-school population family life education	
Democratic Yemen	PDY-79-P08	Out-of-school population family life education	
Egypt	EGY-76-P01	Management, planning and evaluation	
Somalia	SOM-76-P01	Maternal child and family health	
Syrian Arab Republic	SYR-74-P02	Maternal child and family health	
Syrian Arab Republic	SYR-76-P05	Planning for family welfare and women's participation	Completed
Turkey	TUR-77-P05	Management and evaluation support to the GDPP	Completed
Turkey	TUR-79-P09	Establishment of a condom factory	

Europe

Training, research and analysis

Portugal	POR-79-P02	Portuguese fertility survey	
Yugoslavia	YUG-75-P04	Evaluation of the present work on family planning	

Interregional

Training, research and analysis

INT-71-P39	Seminar on fertility in Arab Countries (Cairo Demographic Centre)	Completed
INT-71-P35	Family life research scheme	Completed

Region/major activity	Project symbol and title	Status
<u>Interregional (cont'd)</u>		
<u>Training, research and analysis (cont'd)</u>		
INT-72-P33	Studies on impact of family planning programme on fertility changes and conditions of fertility in World	Completed
INT-73-P28	International Confederation of Christian Family Movements- international meeting in Tanzania on the family	Completed
INT-77-P12	Family Health Publication	
INT-78-P08	Handbook for teachers training in population education/family life education/sex education	
INT-79-P20	Determinants and consequences of family health	Completed
INT-79-P37	Study on women as producers of health care	
INT-79-P56	Infant and young child nutrition; action approaches to the promotion of breast-feeding	
INT-79-P59	Analysis of World Fertility Survey: health aspects	
INT-79-P63	The interrelationships by women and family health	
<u>Global</u>		
<u>Training, research and analysis</u>		
GLO-71-P08	Simulation study on the quantitative implications of education upon fertility	Completed
GLO-73-P64	Research on value aspects of population policy and training ISELS	Completed

Region/major activity	Project symbol and title	Status
<u>Global (cont'd)</u>		
<u>Training, research and analysis (cont'd)</u>		
GLO-77-P31	Socio-demographic analysis of women's education in fertility	
GLO-77-P32	Comparative studies on education, fertility and age at marriage	
GLO-78-P05	Training of women as managers of family planning, health and development delivery systems	
GLO-78-P41	Study on women's employment and family spacing and size	Completed
GLO-78-P45	Income inequality and fertility	Completed
GLO-80-P34	Workshop on the relationship between fertility behaviour and socio-economic development	
GLO-81-P26	Country studies on fertility behaviour and socio-economic behaviour	
<u>Action programmes and awareness creation</u>		
GLO-73-P21	Population and family life education components of rural education development - pilot projects	Completed
GLO-77-P35	Labour policy and family size	Completed

Annex II

Selected Publications on Fertility, Family and Family Planning
from UNFPA-Supported Projects

AFRICA (sub-Saharan)

<u>Project No.</u>	<u>Title of publication</u>
KEN-72-P02	Berger, Jennifer; Ettyang, Linus; Gataru Timothy. <u>Reaching Rural Families in East Africa.</u>
	<u>Women's Groups in Rural Development: An Evaluation of an Approach to Development in the Special Rural Development Areas through Women's Leaders and Their Groups, 1975.</u>
	<u>Improving Family Life in Kenya: A Handbook on Agencies and Programmes. FAO, 1974.</u>
NIR-74-P01	Ecoma, E. E.; Mackenzie, P. <u>Manual for Family Health Workers; 1976.</u>
	<u>Calabar Rural Maternal and Child Health Family Planning Project 1975-80</u>
SIL-78-P02	Okoye, C. S. <u>Fertility Levels and Differentials in Sierra Leone; 1980.</u>
SWA-75-P02	<u>Programmes Related to Family Living in Swaziland: A Handbook. Swaziland, Ministry of Health, 1976.</u>
URT-77-P01	Kennedy, Elinor; Marlin, Chris. <u>Only the Children We Need - Population Education for Rural Tanzania; 1981</u>
RAF-75-P01	Ritchie, Jean A. S. <u>Manual on Child Development, Family Life, Nutrition.</u>
	<u>Report of the Workshop for Trainers and Planners in Programmes to Improve the Quality of Rural Life. Axim, Ghana. ECA 1976.</u>
RAF-76-P02	<u>Report of the ILO/OATUU Regional Workshop in Population and Family Welfare. OATUU/ILO, 1980.</u>
RAF-78-P10	<u>Seminar Inter-iles de L'Ocean Indien. UNFPA, 1979.</u>

ASIA AND THE PACIFIC

<u>Project No.</u>	<u>Title of publication</u>
BGD-74-P05	<u>Choudhury, Lutful, Hoq. Survey on the Impact of Population Education and Labour Laws on Fertility Behaviour of Industrial Workers in Bangladesh. 1978.</u>
BGD-72-P12	<u>Waliullah, S. Annotated Bibliography. Social Psychological Research in Family Planning. 1976.</u>
MAL-79-P01	<u>Huat, Lee Kok. Age at First Marriage in Peninsula Malaysia. University of Malaya, Population Studies Unit.</u>
	<u>Ann, Tan Boon. Socio-Economic Factors Affecting Fertility.</u>
PHI-72-P07	<u>Impact of Changes in Marriage Patterns on Fertility in the Philippines. Philippines National Economic and Development Authority and National Census and Statistics Office. 1978.</u>
PHI-73-P11	<u>Marriage Patterns in Bohol: Trends and Differentials. Philippines, Department of Health, Bohol Province. MCH/FP Project, 1980.</u>
	<u>Relationship Between Infant and Child Mortality and Fertility in Bohol. Philippines, Department of Health, Bohol Province, MCH/FP Project, 1980.</u>
	<u>Trends in Fertility, Infant Mortality and Pregnancy Wastage in Bohol Project Areas 1976-78. Philippines, Department of Health, Bohol Province. MCH/FP Project, 1980.</u>
SIN-73-P01	<u>Wee, Kenneth, K. S. Laws Affecting Population and Family Planning in Singapore. Report No. 1.</u>
SRL-72-P04	<u>Family Health - A Manual for Health Workers in Sri Lanka. Sri Lanka, Family Health Bureau.</u>

ASIA AND THE PACIFIC (Cont'd)

<u>Project No.</u>	<u>Title of publication</u>
RAS-71-P21	<u>Significance of the Relationship between Nutrition and Human Reproduction.</u> ESCAP, Population Division, 1981.
	<u>Reading Profile on Islam and Family Planning: An index of materials.</u> ESCAP, Population Division, 1979.
	<u>Kono, S. Regional Trends in Psycho-Social Research in Fertility and Family Planning.</u> 1980.
RAS-74-P03	<u>Attitudes and Beliefs Related to Fertility Behaviour in Malaysia and Indonesia: Occasional Paper No. 1.</u> UNESCO Regional Communications Unit (Family Planning), 1975.
RAS-76-P04	<u>Family Welfare Education Through Co-operatives in Asia: ILO's Approach and Experiences.</u>
	<u>Population and Family Welfare Education for Workers - A Resource Book for Trainers.</u> ILO Regional Office for Asia and the Pacific, 1980.

LATIN AMERICA AND THE CARIBBEAN

<u>Project No.</u>	<u>Title of publication</u>
COS-73-P01	<u>Educación Sexual y Familiar,</u> Ministerio de Educación Pública. Centro de Orientación Familiar, 1976.
COS-76-P01	<u>Encuesta Nacional de Fecundidad 1976 Costa Rica.</u> Costa Rica, Dirección General de Estadística, 1978.
GUY-74-P01	<u>Guyana Fertility Survey 1975 vol. 1 and 2.</u> Guyana Ministry of Economic Development Statistical Bureau, 1975.
HAI-71-P01	<u>Evaluation of the Development of Family Hygiene - MCH/FP Programme,</u> Haiti. American Public Health Association, 1979.

LATIN AMERICA AND THE CARIBBEAN (Cont'd)

<u>Project No.</u>	<u>Title of publication</u>
JAM-74-P01	<u>Jamaica Fertility Survey 1975-76 - Country Report vol. 1. Jamaica, Department of Statistics, 1979.</u>
MEX-74-P03	<u>Manual de la Familia</u>
TRI-76-P03	<u>Trinidad and Tobago Fertility Survey 1977- Country Report vol. 1 and 2. Trinidad and Tobago, Central Statistics Office, 1981.</u>
RLA-77-P03	<u>Diferencias Socio-económicas de la Fecundidad en Argentina 1958-68. CELADE, 1980.</u>
	<u>Diferencias Socio-económicas de la Fecundidad en Costa Rica 1960-70. CELADE, 1980.</u>
RLA-78-P23	<u>Three-Unit Communications Package on Family Life Education. Decade Media Inc.</u>
RLA-78-P24	<u>Mostajo, Neuy. Actitudes de la Mujer Frente a la Fecundidad y uso de Métodos Anticonceptivos. 1981.</u>
	<u>Baldi6n, W., Edgar. Colombia: Aspectos Socio-Demográficos Relevantes en el Estudio de la Mortalidad Infantil y su Asociación con la Fecundidad.</u>
	<u>Gomez, Elsa. Formación de la Familia y la Participación Laboral Femenina en Colombia. 1981.</u>

MIDDLE EAST AND MEDITERRANEAN

<u>Project No.</u>	<u>Title of publication</u>
EGY-81-P01	<u>Abou-Gamrah, Hamed. Review and Evaluation of Studies on the Determinants of Fertility in Egypt. 1981.</u>
JOR-75-P01	<u>Jordan Fertility Survey 1976 Principal Report vol. 1.</u>
SYR-76-P05	<u>Planning Women's Participation in Family Welfare in Syria. Syrian Arab Republic Women's General Union, 1980.</u>
TUR-76-P02	<u>Turkish Fertility Survey 1978, First Report, vol. I and vol. II.</u>

MIDDLE EAST AND MEDITERRANEAN (Cont'd)

Project No.

RMI-74-P03

Title of publication

Pilot Study on Level of Awareness of Human Rights in General and Women's Rights in Particular in Relation to Family Planning Practice. Egyptian Family Planning Association for Training and Research in FP, UNESCO Regional Population Communication Unit for the Arab States, 1979.

INTERREGIONAL

Project No.

INT-73-P58

Title of publication

Droit - Famille - Developpement Bucharest, 14-16 Octobre 1981. Centre demographique ONU Roumanie.

INT-75-P04

Educational Aspects of Family Health and Integrated Rural Development; WHO, 1975.

INT-76-P03

Women and Family in Rural Development. Annotated Bibliography, FAO Publications and Documents (1966-1976), 1977.

Heel, C.M.G. Influence of Lactation and Nutritional Status on Fertility. An Annotated Bibliography. 1979.

INT-76-P08

Huzayyin, S. A.; Acsádi, G. T. Family and Marriage in Some African and Asiatic Countries. 1976.

INT-78-P06

Scientific Papers of the Indian Fertility Research Programme. Saroj Pachauri, ed., 1980.

INT-80-P09

Infant and Early Childhood Mortality in Relation to Fertility Patterns. Sierra Leone 1973-1975; Sierra Leone.

Infant and Early Childhood Mortality in Relation to Fertility Patterns. Kabul, Afghanistan. Afghanistan, Ministry of Public Health 1978, 1980.

Infant and Early Childhood Mortality in Relation to Fertility Patterns, Greater Khartoum and in the Blue Nile, Kassala and Kordofan Provinces, 1974-1976. Sudan, Ministry of Health, 1981.

GLOBAL

Project No.

Title of publication

GLO-75-P15

Eckholm, Eric; Newland, Kathleen.
Health: The Family Planning Factor.
Worldwatch Paper 10.

Stokes, Bruce. Filling the Family
Planning Gap. Worldwatch Paper 12.

Stokes, Bruce. Men and Family Planning.
Worldwatch Paper 41.

GLO-77-P18

Berelson, Bernard. Demographic
Requirements of Fertility Control
Technology: 15 Propositions.

GLO-77-P31

GLO-77-P32

Workshop on Methodology for the Comparative
Studies of Women's Education and
Fertility, Paris. UNESCO, 1979.

GLO-77-P35

Robinson, W. C.; Stephenson, S. C. Labour
Policies, Female Labour Force
Participation and Fertility: A
Feasibility Study and Research Design.
1979.

GLO-77-P29

United Nations Programme for Comparative
Analysis of World Fertility Survey Data.
A Project the United Nations carried out
in collaboration with UNFPA. United
Nations Population Division.

Some Relationships between Nuptiality and
Fertility in 4 countries of the West
Indies: Results of WFS inquiries in
Jamaica, Trinidad and Tobago, Haiti and
Guyana. United Nations Population
Division, New York, 1980.

UNESCO. Studies on Education - Fertility
Relationship: Comparative Analysis of
Women's Education and Fertility: Progress
Report. United Nations Population
Division, 1979.

Some Factors Affecting Fertility in Eight
Developing Countries. An Analysis of WFS
Survey Data. United Nations Population
Division.

GLOBAL

Project No.

Title of publication

GLO-78-P24

Report on the UNFPA/EWP/Technical Working Group Meeting on Integration of Family Planning with Rural Development. East-West Center, Honolulu, Hawaii, 1978.

GLO-79-P73

Family Planning in the 1980's: Challenges and Opportunities. UNFPA/IPPF/Population Council, New York, 1981.

GLO-80-P09

Hodge, Robert W.; Ogawa, N. Fertility and Marriage in Sri Lanka: Some insights from path analysis.

GLO-80-P24

Some Relationships between Fertility and Education, United Nations Population Division, New York, 1982.

GLO-80-P24

Age at First Marital Union and Fertility. ESCAP, Bangkok, Thailand, Population Division, 1982.

Marital Status Composition and Fertility: A Comparative Analysis of World Fertility Survey Data. United Nations Population Division, New York, 1982.

Some Relationships between Nuptiality and Fertility in Countries of the West Indies. United Nations Population Division, New York, 1982.

Age at First Marital Union and Fertility: Kenya and Lesotho. ECA, Addis Ababa, Ethiopia, Population Division, 1982.

Marital Composition and Fertility: Kenya and Lesotho. ECA, Population Division, 1982.

Levels and Trends in Fertility from WFS Data. (Indonesia) United Nations Population Division, New York, 1982.

F. Technical co-operation in the field of fertility
and the family

United Nations Secretariat*

INTRODUCTION

The present paper refers to the substantive collaboration that the United Nations Department of Technical Co-operation for Development has provided in the field of fertility and family. The objectives are three-fold: (a) to present, within the framework of the structure of its programme, a review of the Department's experience in the implementation of the World Population Plan of Action; (b) to distill from this experience the major problems encountered as well as lessons learned; and (c) to synthesize from (a) and (b) a series of recommendations to improve technical co-operation activities.

The mandate for the Department's activities in the field of population is clearly articulated in section 2 (paras. 100-106) of the "Recommendations for implementation of the World Population Plan of Action", where training in the fields of population, research and support for national institutions dealing with population are stressed. Particular reference to international co-operation with respect to fertility appears in paragraph 31:

"It is recommended that countries wishing to affect fertility levels give priority to implementing development programmes and educational and health strategies which, while contributing to economic growth and higher standards of living, have a decisive impact upon demographic trends, including fertility. International co-operation is called for to give priority to assisting such national efforts in order that these programmes and strategies be carried into effect."1/

Within the United Nations system, the Department of Technical Co-operation for Development is a major executing agency for projects funded by the United Nations Fund for Population Activities (UNFPA) at the country, intercountry and global levels: in 1981, the Department executed 24.5 per cent of the total UNFPA programmes (DP/1982/23, page 6). The population programme provides technical support for population training, support to national research on population dynamics and support to national population programmes.

*Department of Technical Co-operation for Development.

IMPLEMENTATION OF THE WORLD POPULATION PLAN OF ACTION

Data collection, analysis and evaluation

Recognizing that the shortage and limited reliability of demographic data in most developing countries impede the studies needed for a better understanding of human fertility and are a severe handicap in the planning and implementation of related programmes, the Plan of Action called upon international technical co-operation to provide developing countries with support to develop or improve national capacities for data collection, evaluation, analyses and presenting the data in a form responsive to users.

"Developing countries should be provided with technical co-operation, equipment and financial support to develop or improve the population and related statistical programmes... Provision for data gathering assistance should cover fully the need for evaluating, analysing and presenting the data in a form most appropriate to the needs of users".^{2/} Particularly, to underline the importance of the subject, the Plan of Action invited all countries "to co-operate with the World Fertility Survey".

Because fertility topics were viewed as a pivotal population component for the 1980 World Population and Housing Programme, covering the 1975-1984 decade, the United Nations recommended that "priority topics" to be collected in the censuses should include fertility, and most census surveys and vital registration systems did respond accordingly. During the decade, data collection and analysis constituted one of the major areas of the Department's technical co-operation programmes for population activities in the developing countries.

Regarding the execution of these projects, the major decision-making and backstopping process involved the United Nations Statistical Office and the Department's Population Programmes and Projects Branch, the former primarily on data collection and processing, the latter on data analysis, including the preparation of population projections. As a substantive office with expertise in the various technical aspects of data evaluation and analysis, the Department's Population Programmes and Projects Branch was involved quite early in the operation, in the appraisal of project requests prior to approval and in the submission of technical comments on proposed census schedules. Other inputs included the assessment of candidates for adviser posts, briefings for advisers at United Nations headquarters, monitoring of the advisers' activities in the field through technical appraisal of requisite quarterly reports and missions to the field for the on-the-spot assessment of project activities.

The long-term objective of this undertaking was to assist Governments in creating the capacity for conducting all types of demographic data collection and analysing operations and to increase the capacity of Governments to

utilize effectively the data and analysis resulting from censuses, surveys and vital registration systems by taking population factors fully into account in their economic and social development planning.

In order to develop institutional capacities for conducting fertility analysis on a continuous basis, countries have been encouraged to strengthen or to establish demographic sections in national statistical offices. These offices are responsible for conducting demographic analysis and research studies that would determine the consequences of fertility and other related factors on population trends and structure. To assist the countries in building up adequate libraries of publications and references on analysis, the Population Programmes and Projects Branch provided publications and guidelines for demographic analysis. In this respect, the Department in 1980, prepared a publication entitled Demographic Evaluation and Analysis of Population Census Data: Aspects of Technical Co-operation 3/, which describes a summary of techniques of analysis with examples from various census projects that have received United Nations assistance during the early part of the decade of the 1970s.

To facilitate the analysis of population census and survey data for the preparation of fertility studies, the Population Programmes and Projects Branch informed developing countries about available computer software programmes for demographic analysis and population projections. The response was considerable. A large number of developing countries expressed interest in obtaining software packages as well as in receiving training for their nationals in the use of such packages. In response to this apparent extensive interest, the Department prepared a report on computerization of existing analytical methods in demography, which assessed the problems in adapting these software packages on small computers. A project is now being developed to compile, test and adapt major demographic software programmes on computers in developing countries. Through the project, computer technology will be introduced and/or strengthened in developing countries for demographic analysis, existing computer software packages will be installed on national computers, and extensive training will be provided to national personnel in the area of analysis of data from censuses, surveys and vital registration.

Demographic training

The purpose of the United Nations programme of training in population has been to establish within developing nations a cadre of professionals capable of establishing a body of demographic knowledge within their own countries. The past decade has seen the growth of a general recognition of the importance of this type of technical co-operation.

The Department has had little training project involvement directly relevant to fertility and the family. However, the fellowship programme, the United Nations training centres and the vast majority of curricula offered in demographic training programmes at universities established with the technical

co-operation of the United Nations feature a thorough and rigorous treatment of all aspects of fertility and family planning. As such, the Department has accumulated relevant information on progress made in the area and on the problems encountered. In the past decade, at the country level, the programme has been instrumental in the initiation of 40 to 45 new training and research centres located in a university or government department, the strengthening of some 15 existing national centres for demographic studies, and assistance to about five centres of applied research.

In the last decade, approximately 1,500 students have received training at the United Nations-sponsored regional and interregional demographic training centres. At these institutes, the study of fertility is prominent in the course curricula. This includes theoretical as well as methodological aspects. An important feature is the teaching of new methods of estimating fertility from defective or limited data. As a result of the 1974 World Population Conference, the curricula at the United Nations training centres, with respect to fertility, were modified to reflect changing priorities. The changes at one of the interregional centres can be summarized as follows:

(a) Demographic training has been put in a development context, dealing with the impact of development factors on fertility as well as with the impact of levels and trends of fertility on social and economic development;

(b) Curricula have been adapted in such a way as to accommodate (i) the methodological advances made in recent years and (ii) the additions to knowledge about determinants and consequences of fertility trends gained from the masses of surveys (including the World Fertility Survey) and analyses carried out during the last decade;

(c) Particular attention has been paid to population policies and programmes dealing with fertility. Such policies have been developed and adopted by many countries, particularly since the 1974 World Population Conference.

In addition to the direct approach of training individuals at the training institutions, the United Nations also has a continuing programme of fellowships awarded for training in population at institutions in the developed world. The population fellowship programme has been extremely popular among Member States over the decade. Governments undertake to employ former fellowship holders on their return in appropriate posts where their training will be put to practical use. Between 1970 and 1980, approximately 800 candidates received fellowship training. Changing requirements among Member States as to the type of population training they seek for their personnel are manifest in the distribution of fellowship awards as between broad subject matter categories. The general trend may be seen in the table.

Table. Percentage distribution by date of award among three broad subject-matter categories of United Nations population fellowships (excluding those at United Nations-sponsored centres)

Period during which awarded	Subject of study (Percentage)			Total number of awards
	Demography and population studies	Family planning	Population statistics	
Jan. 1970 - Oct. 1974	26.0	42.9	31.1	392
Nov. 1974 - June 1976	47.1	24.7	28.2	85
July 1976 - June 1978	51.5	13.9	35.6	101
July 1978 - June 1980	44.2	5.6	50.2	233

Source: "Technical co-operation activities in population of the Department of Technical Co-operation for Development, 1979-1980: Report of the Secretary-General" (E/CN.9/350), 25 November 1980, p. 9.

Perhaps most striking is the continuous decline since late 1974 in the proportion of fellowships awarded for the study of family planning. During the period from January 1970 to October 1974, 42.9 per cent of awards went to family planning. In the 3 two-year periods that followed the proportion continued to fall, reaching 5.6 per cent for the period 1978-1980. That the decline appears to have started shortly after the World Population Conference of 1974 is perhaps more than a coincidence since, as will be remembered, delegates to the Conference proposed to place family planning within the broader context of economic and social development.

In order to facilitate the placement of students and to raise the awareness of Governments concerning the location of possible programmes where students could receive training in demographic studies (including fertility),

the Department's Population Programmes and Projects Branch prepared a listing of universities and other institutions teaching demography. In addition to this, the Department prepared a basic booklist for a demographic library as well as course curricula which include a set of recommended topics for the teaching of fertility.

Population and development

The goal of the majority of the projects on population policy and development planning is to assist Governments in the process of incorporating population variables into the national development planning process. As such, many projects have provided direct support to fertility studies, whose results were used by Governments in the formulation of national policies. In such projects, support is provided to carry out a fertility survey, with the results then used to prepare recommendations for the Government; or in some cases support is provided for the special analysis of the existing fertility data on which to base recommendations. A project in one Western African country provides an example of the former in which studies on the interrelationship between traditional beliefs, including superstitions, taboos and other cultural, social and anthropological characteristics, and fertility behaviour and patterns, by diverse ethnic groups of the population, were carried out during a period of three years. These studies, including assessment of past studies, field surveys, and interviews, were designed to provide the Governments with basic elements for formulating policies on fertility and for implementing related population programmes with the technical co-operation of the Department.

A project in Latin America provides an example of the latter in which studies used data provided by the 1970 and 1980 censuses at the regional level, by urban and rural and by different socio-economic strata, as well as through national surveys. Special tabulations of the censuses were prepared and analysed at different regional levels in order to identify the specific causes and determinants of different levels and trends of fertility. The results of these studies formed the basis of recommendations for fertility policies which in turn were successfully integrated into the national development strategy.

From the above discussion, it has no doubt become clear that activities in the areas of training, demographic analysis and population and development, are linked one with another. That is, with respect to fertility, the Department programme generates a process of development in such a way that training creates the ability to design and conduct fertility surveys, the analysis of which can be used in the formulation of policy to be incorporated into national development plans. The experience of the last decade has also permitted us to become cognizant of the problems that have created obstacles to the achievement of these goals.

Constraints on project implementation

With respect to the Department's project implementation, particular problems became salient during the decade of experience. In some areas, problems persist, in others awareness of the problem leads to new directions of action and an amelioration of the difficulty. One of the more serious problems posed in giving support to national demographic research concerned the lack of importance placed on the analysis of census, survey and vital registration results in the preparation of fertility studies. The problem arose, in part, because of poor planning during project formulation in which the analysis of demographic and socio-economic data was not incorporated as an integral part of the census operation. In the early part of the decade, the major preoccupation of these projects was the collection, processing and tabulation of data with limited evaluation and analysis of these data being undertaken. It is believed that much of the data collected in the first round of the 1970 census programme (1965-1974) were never analysed and reported. There are doubts whether the evaluation and analysis of these censuses will be conducted since the countries concerned are already in the process of preparing for the second round of the 1980 censuses. The chances of organizing post-census analysis seminars or workshops on data utilization become extremely limited when the data are not analysed and reported. Thus, the dissemination of information on fertility and other population components for which data were collected has been limited to the distribution of completed tabulations of raw data to the users in the government ministries in some cases.

However, during the latter half of the decade, through technical co-operation, sufficient awareness was created among countries about the need to evaluate the data for coverage and content and to analyse the results. These efforts were made in large part to produce more reliable data to estimate fertility levels and trends. To date, approximately 30 developing countries have completed the analysis of their population census results and published their reports in a form that are easily utilized by planners and non-demographers. In each of these projects, analysis of fertility data featured prominently and included evaluation of the data, estimates of fertility rates and levels, and indications of differential fertility by age, region, sedentary/nomadic, education and rural-urban areas.

A major problem arising in the execution of projects supporting population programmes and policies concerned government motivation. Specifically, it was quite common in Africa and Latin America that Governments were aware of the importance of analysing the interrelationships between population and development in designing national development programmes but that the perception of the role of fertility research was often not clear. Such studies were frequently associated with family planning and hence the Government had little motivation for fertility research. In cases where motivation was absent, the tendency was to spend a considerable amount of time (perhaps three to four years) on activities that merely created greater awareness and/or interest among government officials in incorporating

fertility variables into planning. Still, many countries are not yet aware of the full usefulness of undertaking fertility studies as part of their research support for overall planning. In many cases, by the time the project activities succeed in developing the necessary motivation, the projects are already near completion and approval for their extension becomes difficult in spite of the Government's interest. Thus a project designed to affect national policies with respect to fertility probably requires a greater time-span than had previously been accorded for its programme to achieve its main objectives. In one of the few instances (a country in Latin America) where United Nations assistance was fully utilized in the national planning exercise, the Government had a strong commitment and interest in population and planning prior to the submission of the project proposal. Because of keen government interest, the project was able to achieve its main objective - the incorporation into the five-year development plan of the recommendations and results of the fertility studies undertaken.

Another related problem which has developed is that even among countries that have clear-cut policies on fertility (especially countries in the Economic and Social Commission for Asia and the Pacific (ESCAP) region), these policies have often not been implemented as integral parts of the national development strategy. The problem is partly due to the fact that most policies on fertility have been formulated not by the department of planning but by the department of health. Technical co-operation in this area, on the one hand, has emphasized research activities such as the impact of fertility policies and family planning programmes on development objectives, while neglecting the mechanisms of implementation which would include developing linkages with other ministries. In short, despite technical assistance efforts in this area, there still persists a large lack of awareness among planners and policy-makers of the impact of socio-economic factors on fertility behaviour and of the influence of fertility change on development. This lack of awareness among planners and policy-makers is due, in part, again to poor planning during the project design stage, in which activities to publicize and disseminate the results of fertility studies were not incorporated. More recently, Governments are being advised about the value of organizing workshops or seminars to discuss the implications of fertility survey results for planning and other purposes.

A problem common to projects on population has been the lack of infrastructure and other national counterpart support for the projects. In training, this appeared in several ways, including the lack of necessary academic background of students, of the appropriate institutional setting and of national counterparts to replace United Nations advisers when their contracts came to an end. A related ramification was that once students had been trained, either locally or out of the region, it was often the case that the infrastructure could not absorb the highly trained individuals, which contributed to the phenomenon of "brain drain".

The lack of infrastructure and national counterpart is a complex problem. Because of it, for many of the projects executed by the Department in developing countries, the recruitment of international personnel (advisers)

constitutes a large component of the project. Experience has shown that it has been sometimes difficult to find an adviser with the expertise that would allow him or her to respond adequately to the objectives and tasks of the project. Many developing countries would prefer advisers from other developing countries with similar local circumstances and cultural background. However, the problem of the availability of such advisers, especially in Africa, is often aggravated by the fact that their services are required by their own Governments. In such instances, increasing use has been made of national specialists and short-term consultants.

Another vulnerable area of project implementation has been the lack of sufficient articulation of different phases of the projects, particularly relating to project monitoring, evaluation and feedback, both in operational and substantive terms. The relationships between project objectives, inputs, activities and outputs have also not often been clarified in detail. The Department has taken steps to improve the situation.

RECOMMENDATIONS

The enthusiasm raised by the Bucharest Conference and by the implementation of the WPPA generated national interest in population programmes and thereby produced numerous projects for technical co-operation. During the decade, progress was made in assisting most developing countries in conducting and analysing at least their first population census. In the process, national capabilities to undertake fertility studies and analysis have been well developed. Either directly or indirectly the impact of such activities on the overall planning exercises by Governments has been positive and crucial since all planning exercises have to employ at some point demographic projections using fertility studies in order to predict socio-economic demands such as those on education and employment.

From the experience gained during the previous decade, several recommendations may be proposed with respect to the provision of technical co-operation in the future.

Although the goal of technical co-operation has been institution-building, that is, to generate the capacity in developing countries to train students in the field of fertility or to undertake fertility research and to incorporate their findings into national development planning, the capacity to date has not been fully realized. As a result, projects in the future must give special attention to achieving the objective of institution-building. This could be done either by more realistic project formulation and work planning or by a reorganization of priority activities within projects. For example, it is clear that a lack of awareness persists among policy-makers of the relationship between fertility patterns and economic planning. Therefore, in the future, priority should be given within projects of support to population units for informal training sessions that would include individuals from related government ministries. This would be essential in order to raise

the awareness of non-demographers to the importance of incorporating demographic variables into their work.

As reliance on the computer for demographic analysis will continue to expand, future projects should incorporate a segment on training and installation of demographic software packages.

In order to provide a forum for data producers and consumers to discuss the implications of census analysis or fertility survey results for planning and other purposes as well as to disseminate the information obtained, it is recommended that projects should include and give priority to the organization of seminars or workshops in which planners and policy-makers would participate with data producers to discuss the data produced and their utilization for planners.

Also, an important component of training projects should be activities related to job creation, both governmental and non-governmental. If a degree programme with an emphasis on fertility, for example, has been created at a university, part of the technical co-operation activities should be geared towards expanding job opportunities within the academic and/or business communities. This would address the problems associated with brain drain as well as provide an environment favourable for the return of those students receiving education abroad.

The women's component on all surveys and in national censuses should be thoroughly re-examined to ensure that crucial socio-economic variables shall be included in questionnaires and that reliable socio-economic indicators shall be developed, not only for measuring fertility per se but also for identifying socio-economic variables that might better explain variations and differentials in fertility rates and their impact on development.

Finally, the components of monitoring, evaluation and feedback of projects, both in operational and substantive terms, should be built into the project formulation and implementation.

Notes

1/ Report of the United Nations World Population Conference, Bucharest, 19-30 August 1974 (United Nations publication, Sales No. E.75.XIII.3), chap. I.

2/ Ibid., para. 76.

3/ United Nations publication, Sales No. E.80.XIII.3.

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